



Oregon ACM Chapter Praises 370 Takeover

By Robert Glass

Special to Computerworld

CORVALLIS, Ore. — Bill Fellingner's commandeering of a state 370/158 from a remote terminal [CW, April 24] "was a highly professional attempt to draw attention" to the system's lack of security and other concerns, the local Association for Computing Machinery (ACM) chapter has stated.

In a letter to Oregon Governor Tom McCall, the ACM chapter contended that Fellingner's action pointed out "existing computer installations in the state are not secure, contrary to the claims of the manufacturer."

Also, Fellingner managed to show that the potential exists "for unauthorized data and personnel file manipulation of disastrous proportions..."

And Fellingner demonstrated that "it is no longer rational to rely solely on the good faith and promises of the computer vendor to assure data security. It must be an integrated part of the state's overall

(Continued on Page 5)

California May Take IBM To Court on Teale Contract

SACRAMENTO — The California Assembly may decide next week on whether to bring IBM to court for possible contract violations for the Teale DP center.

The Assembly Ways and Means Committee met here last week and postponed any further action until at least June 5.

IBM has acknowledged it will miss a July 1 deadline, after winning the \$20 million contract on the basis of being the only vendor which claimed the ability to meet that deadline.

Legislators and Auditor General Harvey M. Rose expressed skepticism last week that IBM could meet the "slippage" date of Aug. 4, and Rose went so far as to suggest that funding for the Teale center might be suspended at the end of this fiscal year.

He suggested that if, in fact, the deadlines are unreasonable, the contract might be renegotiated after July 1.

On the Inside This Week

Rutgers Battles N.J. For Control of DEC PDP-10	—Page 7
Used 360s Steady At 25% of New Price	—Page 27
Communications	16
Computer Industry	27
Editorial	10
Financial	38
Societies	24
Software/Services	13
Systems/Peripherals	19

For Both DOS, OS Users

Intel Implements VS on 'Real' 360/370s

By Don Leavitt
Of the CW Staff

SAN FRANCISCO — Intel Corp. has modified IBM's DOS/VS coding to make most of the operating system's capabilities available to 360 and 370 systems running in nonvirtual or "real" mode. The revised software provides more flexibility than conventional DOS and, according to several benchmarks, faster throughput than unaltered DOS/VS.

The leasing company also expects to have a version of OS/VS1, keyed especially to Vsam support, available for 360 or 370 shops using IBM's OS 21.7.

The software modifications will be available in the autumn, but only on 360s or 370s acquired from Intel.

Extra Bonus

To make some of IBM's coding acceptable to the 360, software simulation of

new 370 instructions had to be developed. This simulation provides the added advantage, Intel noted, of making available to the 360 any application programs that include 370 instructions.

With the 360 DOS/VS package, users will have five partitions. They will also gain relocatability of programs, procedure library support, the faster assembler and dynamic linkage editor, and supervisor selection at IPL time.

Several of these features, or comparable capabilities, are already available from independent software houses, the company admitted, but added that its current effort is the only one it knows of that attempts to shift all the DOS/VS features, essentially as IBM wrote them, back to the 360s and real 370s.

The OS/VS1 support under OS 21.7 came about basically to provide users with support for Vsam. The IBM re-

placement for Isam, Vsam provides faster accessing and has better performance characteristics overall, an Intel source said. Even without those benefits, the effort permits portability and sharing of data files using the new access method, between 370s and 360s, Intel stressed.

Because the move to put Vsam under "real" OS required use of other OS/VS1 features as well, the Intel software team soon found that almost all of the VS system had, almost unintentionally, been made available in the OS 21.7 environment.

Aside from immediate operational benefits, the transplanted VS-based support provides users with two long-term gains, Intel explained.

Though IBM will be putting all its efforts, including new device support, into VS mode, these will be available to the Intel 360 or small 370 user as well.

Psychologically, users whose needs can be met with 360 hardware need no longer feel defensive about the growth potential they can offer their staffs. Now their people, too, can attend the latest schools and stay near the state-of-the-art in software.

Changed Environment

To make DOS/VS function on a 360, Intel had to change the system environment from Extended Control (EC) to Basic Control (BC) mode. Paging control and Channel Control Word (CCW) translation was taken out of the supervisor.

The "downward" implementation does not provide virtual storage, and user programs have to be limited to actual space available within each partition unless overlay techniques are used. However the dropping of CCW handling and paging has allowed a cutback of 15K bytes in the supervisor, and this space can be distributed to the partitions, making them larger than they might be otherwise.

The advantage of BC mode for a program that doesn't need the dynamics of virtual storage was illustrated last week by an assembly run on a 370/145, first with Intel's implementation of DOS/VS, then with IBM's. Using the fast assembler in both cases, the test took 3.32 minutes with Intel's system, and 4.38 minutes with IBM's.

Under multiprogramming, the BC-based Intel software provided a 14.18% throughput (Continued on Page 4)

GSA's Fednet Feared Start Of Massive Data Bank Plan

By Nancy French
Of the CW Staff

WASHINGTON, D.C. — The General Services Administration's (GSA) plans for a "Fednet computer system" could be the beginning of a massive data bank combining confidential information on all Americans into a single system, accessible through terminals in a coast-to-coast network, legislators and executive officials here are saying.

Concern expressed by Vice-President Gerald R. Ford [CW, May 15], Sen. Sam J. Ervin (D-N.C.), Reps. William Moorhead (D-Pa.) and John E. Moss (D-Calif.), and echoed by the top echelons of the Office of Management and Budget, indicate the GSA may have exceeded its statutory authority in initiating purchase of massive computer systems and the equipment to link them.

The scenario began to unfold about two months ago when the GSA and the Department of Agriculture invited bids [CW, March 20] on compatible systems that could be linked by lines or terminals connecting, according to Ervin, "thousands" of sites.

On Capitol Hill, where legislators have already been grappling with ways to limit the growing invasion of citizens' privacy by computerized data banks, the response was electric.

In a speech on the Senate floor, Ervin charged that "the GSA has quietly developed and sent out for bid a project which could link all new federal agency computers into one system, with remote automatic access for thousands of computer terminals in government offices around the country. Each local office could have the ability to get information stored in the central computers, Ervin asserted.

"In charge of this, the Fednet system would have one 'information czar,' presumably chosen by GSA," Ervin said.

Misunderstood Motives

GSA spokesman Dennis Blaeuer said the GSA motives were completely misunderstood and the information was "false."

"Fednet" — a term he said "was picked

up" last fall — has been taken as "something sinister. The facts are that our management philosophy has changed. We're tired of doing 10 different things in 10 different regions. We are no longer going to undertake anything without taking into consideration the direction of

(Continued on Page 4)

White House File Lists 'Top' Names

By a CW Staff Writer

WASHINGTON, D.C. — Around 3,000 top-level federal employees are being advised that their names and other vital statistics such as ethnic, political and work backgrounds are being stored in a White House data file.

Those people whose names are contained in the White House data bank were notified in an effort to "get ahead of the power curve — to be sure no one would construe the file as improper or illegal,"

(Continued on Page 4)

IBM Dressing 3705s for SDLC

By Ronald A. Frank
Of the CW Staff

NEWTON, Mass. — The next time your local IBM customer engineer asks to "borrow" your 3705 front end for about two hours, he may be installing an enhancement that will later allow the use of Synchronous Data Link Control (SDLC) through Network Control Program (NCP) software.

The engineering modification is part of an "omnibus" series of changes being made by IBM customer engineers to 3705s installed at user sites.

The SDLC changes are related to the operation of the scanner in the 3705. The scanner is a multiplexer-type de-

vice that interfaces between the communications control unit (which is the logic and memory part of the 3705) and the line interface.

A single card is being installed on Type 2 communications scanners that corrects DLC circuits, according to IBM. The term DLC for Data Link Control is used by IBM when referring to 370X implementations but it is identical to the SDLC protocol.

The new DLC card is required because "a problem has been uncovered by some of our diagnostic testing of the DLC circuits," an IBM spokesman said. The card also contains start/stop

(Continued on Page 5)



DR. H.R.J. GROSCH, editorial director
EDWARD J. BRIDE, editor

E. DRAKE LUNDELL JR., associate editor.
RONALD A. FRANK, associate editor, technical news.
JUDITH KRAMER, chief copy editor.
V.J. FARMER, systems editor.
DONALD LEAVITT, software editor.
MARY UPTON, financial editor and assistant computer industry editor.
LESLIE FLANAGAN, photography editor.
JESSE VICTOR, copy editor.
NANCY FRENCH, PATRICK G. WARD, TONI WISEMAN, MARGUERITE Y. ZIENTARA, staff writers.

MARVIN SMALHEISER, West Coast bureau.
J.H. BONNETT, European bureau.
HIDET-SUNA SASAKI, Asian bureau.

CONTRIBUTORS: J. DANIEL COUGER, education column; ALAN TAYLOR, Taylor Report and professional practices.

NEAL WILDER, vice president - marketing.
DOROTHY TRAVIS, sales administrator.
JUDY MILFORD, advertising coordinator.
KATHRYN V. DINNEEN, market research.

LEETE DOTY, production manager.
HENRY FLING, production supervisor.

W. WALTER BOYD, publication manager.
PATRICK J. MCGOVERN, publisher.

EDITORIAL OFFICES: 797 Washington St., Newton, Mass. 02160. Phone: (617) 965-5800. Telex: 92-2529. Los Angeles: 963 N. Edgecliffe Drive, Los Angeles, Calif. 90026. Phone: (213) 665-6008. Europe: Computerworld, c/o IDC Europa, Ltd., 140-146 Camden Street, London NW1 9PF, England. Phone: (01) 485-2248/9. Asia: Computerworld, c/o Dempa/Computerworld Company, Dempa Building, 1-11-15, Higashi Gotanda 1-chome, Shinagawa-ku, Tokyo 141. Phone: (03) 445-6101. Telex: 26792.

Second-class postage paid at Boston, Mass., and additional mailing offices. Published weekly (except: a single combined issue for the last week in December and the first week in January) by Computerworld, Inc., 797 Washington St., Newton, Mass. 02160. © 1974 by Computerworld, Inc.

50 cents a copy; \$12 a year in the U.S.; \$13 a year in Canada; all other foreign, \$36 a year. MARGARET PHELAN, circulation manager. Four weeks' notice required for change of address. Address all subscription correspondence to circulation manager, Computerworld, 797 Washington St., Newton, Mass. 02160

Reproduction of material appearing in Computerworld is strictly forbidden without written permission. Send all requests to publication manager.

Computerworld can be purchased on 35mm microfilm in half-volumes (six-month periods) through University Microfilm, Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone: (313) 761-4700.

COMPUTERWORLD, INC.
Patrick J. McGovern president
W. Walter Boyd executive vice president
Robert M. Patterson vice president-int'l.
T. Neal Wilder vice president-marketing



POSTMASTER: Send Form 3579 (Change of Address) to Computerworld Circulation Dept., 797 Washington St., Newton, Mass. 02160.

Competition Proves 'Maturity' of EFTS

By Don Leavitt
Of the CW Staff

SAN FRANCISCO — The growing importance of electronic funds transfer systems (EFTS) is affecting both financial institutions and the people that work for them in areas that support EFTS efforts, according to a long-time observer.

The payment system evolution "is the biggest development in the financial industry in our generation . . . and, in a few years, will be more significant than the development of the computer itself," Dale L. Reistad told a session at the national operations and automation conference of the American Bankers Association.

If that seemed an exaggerated evaluation, he noted that "the advent of [neither the computer nor the credit card] brought about the need for presidential commissions" such as the ones that have been working on EFTS.

EFTS "must be on its way to maturity," the president of Payment Systems, Inc. went on, "or why would we be talking about it in terms of competition?"

Project Short-Lived

Over the years, various projects have

appeared briefly, "but never stay around long enough to operate in a competitive environment. In recent months there has been a change to all this, however, because EFTS actions are beginning to cause rather rapid reactions," Reistad said.

The first reaction to the Hinky Dinky experiment of the First Federal Savings and Loan in Lincoln, Neb., [CW, Feb. 13] was litigation, he admitted, "but

CW at ABA

there will probably be a more meaningful reaction, in terms of a competitive service launched by commercial banks."

Individual banks that have installed cash dispensers and automated teller units "know from experience that [this will be met] generally in the form of very similar installations in the offices of competing banks, but in some cases from other financial institutions as well."

Other competition may appear, Reistad thought, from retailers working with point-of-sale terminals and "perhaps with

ties to other banks or thrift institutions." In addition, government regulatory agencies are stepping into the picture.

"The interest of the Federal Reserve Bank in becoming more intimately involved with EFTS is now a matter of public record," Reistad reminded his listeners. "And the Federal Home Loan Bank System has already in-being a network of on-line computer centers providing direct accounting services to the savings and loan industry," he added.

Market research tests of consumer and merchant attitudes toward EFTS vary widely across the country, not only because of demographic differences, Reistad thought, "but also because of exposures the community has had to gradations of electronic banking systems."

Despite some public apathy the move is on, and as individuals, bankers "must be aware that the ranks of the EFTS cadre are thin indeed and talent already commands a premium."

"The bulk of talent available is predominantly in the DP, credit card, marketing and long-range planning areas of commercial banks," Reistad said, adding that professionals in those areas "should welcome the opportunities afforded by EFTS as the career paths multiply."

Step-by-Step Approach Advocated

Spoon-Fed on EFTS, Public Will 'Clamor for More'

PINEHURST, N.C. — Customer acceptance, an anticipated stumbling block to electronic funds transfer systems (EFTS) — will be won by feeding the public EFTS services a little at a time until automatic payroll deposits, preauthorized payments and automated tellers, for example, are found to be so convenient that the public will clamor for more, according to Rex J. Morthland, president of the American Bankers Association (ABA).

"Through a step-by-step approach, the complete package of electronic services will emerge as a natural progression," and acceptance will result when the services

are found to be "needed, supply direct benefits, run smoothly and can be easily understood," Morthland told a meeting of the North Carolina Bankers Association here recently.

People Will 'Adjust'

"By introducing EFTS services which appear to follow established patterns, and by introducing these services in a systematic manner, the public will adjust and adapt without major problems," he continued.

Morthland said a recent ABA-sponsored study found automatic payroll deposits to be one of the most acceptable electronic banking services. He said, "Employees who had not participated in a direct deposit program were willing to try it because, according to the study, their paychecks are deposited automatically even if they are on the road or in another part of town on payday."

He warned that to keep the public's confidence, "we must introduce only those services which run smoothly, which have been tested thoroughly and appear to be 'bug-free.'"

The second service he urged bankers to adopt, preauthorized payments, is part of the natural progression, because "people often find preauthorized transfers to a savings account an easy means of en-

forced savings. Money is taken off the top and never poses a temptation to be spent," he explained.

"By the same token," he said, "an automatic mortgage or installment loan payment saves the customer the inconvenience of writing or delivering a check."

Described by Morthland as a variation on automatic payments, the "bill check" allows a bank customer to simply sign his bill and return it to the creditor. The creditor then places the information on a tape, submits it to an automated clearinghouse (ACH), and the amount of the bill is then deducted from the customer's account, thus expediting the payments clearance system, he explained.

Branch Alternative

The automated teller, the third component of the emerging EFTS system, will provide a link between the old and the new methods of furnishing bank services, according to Morthland, "even serving as an alternative to small branch banks," he said.

Although some electronic transfer programs have been discontinued in Seattle, Wash., and Hempstead, N.Y., for a variety of reasons, not one case was due to public rejection of electronic transfers, nor does the discontinuance mean the plans lacked merit, Morthland stated.

Codasyl Fortran Committee To Develop Data Base Support

UNIVERSITY PARK, Pa. — Codasyl has announced the formation of a Fortran Data Manipulation Language Committee to develop proposed specifications that will add data base support to Fortran, and at the same time has announced plans for an initial meeting of the new committee in Boston on June 12.

Dr. Chester M. Smith Jr. of the Pennsylvania State University has agreed to chair the new group and has asked anyone interested to contact him at the university computer center here before the June meeting, if possible.

ATTACH LABEL HERE for address change or inquiry. The code line on top may not mean much to you, but it is the only way we have of quickly identifying your records. If you are receiving duplicate copies, please send both labels. Please let us know four weeks before you plan to move. List new address below and include a current mailing label or your old address.

One year for:
☐ U.S. — \$12
☐ Canada — \$13
☐ Other foreign — \$36

CHECK HERE TO ENTER YOUR SUBSCRIPTION

☐ Charge My American Express Account:
☐ New subscription
☐ Change of address

If charge we must have cardholder's signature:

First Initial	Middle Initial	Surname										
Your Title												
Company Name												
Send to: Address												
City										State	Zip Code	

Address shown is: ☐ Business ☐ Home ☐ Check here if you do not want to receive promotional mail from Computerworld.

COMPUTERWORLD

Circulation Department
797 Washington St., Newton, Mass. 02160

PLEASE CIRCLE 1 NUMBER IN EACH CATEGORY

YOUR INDUSTRY

- 01 Mining/Construction/Oil & Refin.
- 02 Manufacturing — Computer or data system hardware/peripherals/ other associated mechanical devices
- 03 Manufacturing (other)
- 04 Utilities/Comm Sys/Transport
- 05 Wholesale/Retail
- 06 Finance/Insurance/Real Estate
- 07 DP Serv. Bureaus/Software/Plann.
- 08 Business Services (except DP)
- 09 Education/Medical/Legal
- 10 Federal, State and Local Govt.
- 12 Communications/Printing/Publ.
- 13 Other:

YOUR FUNCTION

- 01 Corporate Officer
- 02 Data Processing & other Operational Mgmt
- 03 Data Processing Professional Staff
- 04 Consultant
- 05 Lawyer/Accountant
- 06 Engineering-Management/Scientific/R&D
- 07 Sales/Marketing/Account Exec.
- 08 Librarian/Educator/Student
- 09 Other:

Vendor Resources, Software Adaptability Important in Package Selection

PRINCETON, N.J.—A source maintenance system is one of the most heavily used software packages a computer installation will ever invest in, according to ADR, the Princeton software house. At most installations, its frequency of use over a long period of time will exceed even that of IBM's compilers and the linkage editor. An equally important consideration, says ADR, is the potential life span of the source maintenance system. Once a computer installation becomes dependent on it, the maintenance package is likely to be an integral part of their operation for many years to come, through all kinds of environmental changes and equipment upgrades, such as S/360 to S/370, DOS to OS, and 2314 to 3330 or 3340 discs. The vendor must have the resources, and the software must have the versatility required to adapt to these changing conditions.

New File Design Developed

ADR's source maintenance system, The LIBRARIAN, has undergone evolution-

ary development since the 15-year old independent software house first introduced it five years ago. Initially it operated under OS and supported tape libraries only; subsequently a DOS version was developed, followed by support for random access disc libraries in both the OS and DOS versions. Recently, a new storage technique known as AFO—Advanced File Organization—was incorporated into The LIBRARIAN. This technique is designed to optimize performance when libraries are allocated to the large-capacity 3330 and 3340 discs. AFO, which required over 3 man/years of development effort, features a "floating directory" which automatically increases its capacity as an installation's storage needs grow. The new technique, which is conceptually similar to VSAM, obviates the need for reorganization or periodic maintenance of direct access libraries.

Facilities for Updating and Backup

The LIBRARIAN provides a number of features for programmers, including

updating commands that operate on complete statements or strings of characters within statements. Programmers can make temporary or permanent changes to a source program and pass either test or production versions of a program to any of IBM's language translators. Facilities are provided to protect against updating an out-of-date or mis-named program, and to prevent redundant application of the same set of changes. All changes successfully applied are summarized and printed in a supplementary report; each statement changed has the date of change permanently associated with it for auditing purposes.

The LIBRARIAN provides facilities for the creation of disc libraries and for initial loading of data into these libraries from cards or from libraries supported by other maintenance systems. Manual or automatic back-up and restoration of libraries is supported, and several levels of security are available for protection against unauthorized data access or modification. Also supplied with

the system is an interface to IBM's TSO; other ADR software products are equipped with interfaces permitting them to directly access data stored under The LIBRARIAN.

The system is installed by ADR field personnel and is available under monthly or permanent licenses which incorporate a 30-day no-obligation acceptance period.

Context Editing Aids Program Maintenance

PRINCETON, N.J.—The ability to make character string substitutions is an important characteristic of any source program maintenance system, according to ADR. All time sharing systems support this feature, and it is equally important in a batch-oriented program like The LIBRARIAN. Character string substitution, or context editing as it is sometimes called, involves searching a file for a designated string of characters, and when located, substituting a second character string for the original. Other characters in a record that is context edited are expanded or contracted according to the relative length of the two strings involved in the operation.

Used in Global Operations

Context editing is highly useful when making global changes to a source program. For example, if a data name in a COBOL program is changed, all procedure division references to that name must also be changed. Context editing allows a programmer to replace all occurrences of the old data name with the new name in a single operation. A summary printout of all records modified by the edit function is produced for verification purposes. In addition to its value in program maintenance activities, context editing can be quite useful when preparing and modifying textual material such as memoranda or narrative descriptions of programs and systems.

Source Maintenance System Nears 1200 Installations

PRINCETON, N.J.—ADR reports that its source program retrieval and maintenance system, The LIBRARIAN, is installed at almost 1200 sites throughout the world, making it the most widely used program of its kind. In addition to sites in almost every state in the U.S., including Alaska and Hawaii, The LIBRARIAN is heavily used abroad. France and Canada top the list of foreign countries with multiple installations of The LIBRARIAN, followed by the Scandinavian countries, Switzerland, and Belgium. The system is also in use at computer installations in Brazil, Japan, and Australia.

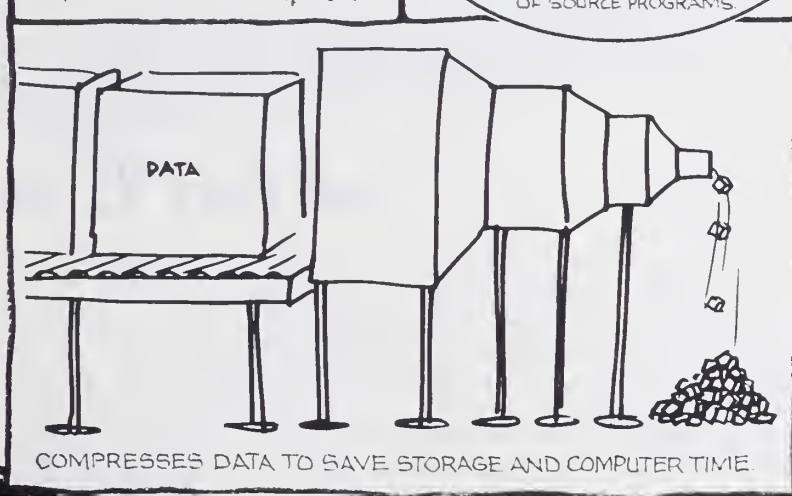
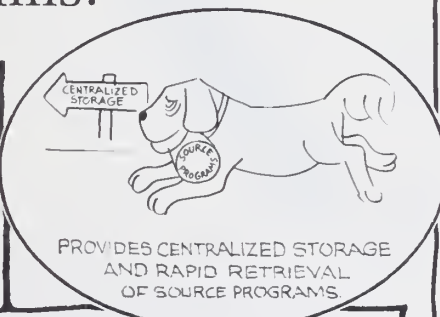
Supports Many Devices

The LIBRARIAN was first introduced by ADR in 1969. It operates on IBM S/360 and S/370 under OS MFT, MVT, VS1, and VS2. The DOS version operates with POWER and GRASP and under DOS-VS. Devices supported include all types of tape drives and 2314, 3330, and the new 3340 disc drives.

Did You Know?

One of a series MAKING IBM INSTALLATIONS WORK BETTER

The LIBRARIAN. All-in-One
Security Guard, Auditor,
and Maintenance Man
for Your Programs.



The LIBRARIAN is at work at 1200 companies around the world . . . maintaining, auditing, and protecting source programs. Shouldn't your company gain these benefits too?

Programs represent one of your company's major assets . . . perhaps its largest. Whether you're a programmer, data processing manager, director, controller, president, or company friend, if you think programs are valuable, then protect them. Look into The LIBRARIAN from ADR. You owe it to your company.

For additional information, just send us the attached coupon, or contact any ADR office.



APPLIED DATA RESEARCH THE SOFTWARE BUILDERS®

ADR software products: in use at over 3,000 installations worldwide.

APPLIED DATA RESEARCH, INC.
SOFTWARE PRODUCTS DIVISION
Route 206 Center Princeton, New Jersey 08540
Telephone (609) 924-9100
Yes I am interested in learning more about
The LIBRARIAN.

Name _____

Company _____ Title _____

Address _____

City _____ State _____ Zip _____

Telephone _____

Computer Configuration

- I am also interested in
- ☐ AUTOFLOW II® for maintenance and debugging
 - ☐ MetaCOBOL® for increased productivity
 - ☐ SAM for planning through simulation
 - ☐ PI SORT for faster sorting
 - ☐ ROSCOE for on line program development

U.S. Offices in Boston, Chicago, Cleveland, Houston, Los Angeles, New York, Pittsburgh, Princeton, Washington, D.C.

Representatives in Australia, Austria, Belgium, Brazil, Canada, Denmark, England, Finland, France, Germany, Korea, Italy, Japan, Mexico, Netherlands, Norway, Philippines, Puerto Rico, Singapore, South Africa, Spain, Sweden, Switzerland, Taiwan, Thailand, West Germany.

GSA's Fednet Feared Beginning Of Massive Federal Data Bank

(Continued from Page 1)

our whole agency," Blauer explained.

"The systems we are purchasing for use by GSA and [Agriculture] were let under a single procurement to take advantage of volume discounts. They are separate systems, secure from each other," he said.

Blauer explained that privacy was not an issue in this case because the computers will be used "strictly for internal management. The GSA doesn't even deal with matters affecting individuals," he said.

"GSA is responsible for the federal supply system and we have, like all agencies, payroll accounting. We also have a management information system that helps us keep track of how much floor space is available in public buildings at any given time throughout the country, and how much we're spending on custodial service, for example.

"Agriculture will use theirs for their own purposes as well," he said.

Blauer cited the Brooks Bill, PL 89-306, which placed responsibility for purchasing government DP equipment and setting data processing policy within the GSA, as justification for the agency's action.

Meanwhile, in the Office of Management and Budget, Director Roy Ash composed a letter telling GSA director Arthur Sampson the system is neither suitable nor cost-effective:

"The proposed data communications network is not responsive to the Department of Agriculture's requirements; moreover, the pending procurement is inconsistent with the guidance of the Office of Telecommunications Policy which has called for termination of the proposals," the letter said.

In addition, he said "there is no economic advantage to the proposed acquisition of the initial GSA site. More importantly, there are a number of viable alternatives which satisfy GSA's internal processing requirements . . .

"With regard to the three optional GSA sites, there is no identifiable workload associated with these machines nor is there an assurance that this particular configuration will satisfy future needs," Ash said.

Ash finally said the proposed acquisition of DP and telecommunication capability for unspecified uses poses a serious potential "threat to the right of privacy

at a time when this issue is under intense review by the Executive Branch and the Congress . . ."

In another letter, this one from Moss, Sampson was asked, "by what authority" the GSA had "put out this project for bids without formal authorization or appropriations permission from the Congress. Moss said he feared with great misgivings and alarm "such a system that could enable a government agency to initiate a push button search into all aspects of the private lives of Americans who have ever interacted with participating federal agencies . . ."

More Questions Raised

Larry Baskir, chief counsel and staff director of the Senate Subcommittee on Constitutional Rights, raised more doubts about the objectives of the system with these questions:

"Why are the systems compatible? What purpose will be served by the massive communications package they are seeking bids on?

"Why have GSA officials met with officials from the Veterans Administration and Social Security, for example, if the intended use of the system is limited to 'internal management'?"

"Why has GSA invited the Air Force and its Advanced Projects Research Agency (which already operates a nationwide computer network) to not only

participate in selecting the equipment vendor, but to also help set rules and standards for use of the system?

"Why, when Congressman Moorhead surveyed government agencies to determine their plans for future computer acquisitions and then conducted hearings on the subject did the GSA and Agriculture Department fail to make public this project?"

Such measures hardly seem necessary if Agriculture is using its system to "count chickens" and GSA, "paper clips," Baskir said.

Contract Modified

Baskir said the GSA has now split its purchase requirements, and in a news release mailed to vendors last week the

Afips Establishes Privacy Committee

MONTVALE, N.J. — A special committee on the right of privacy, chaired by Dr. Willis H. Ware of the Rand Corp., has been established by the American Federation of Information Processing Societies (Afips) in response to the invitation issued by Vice-President Gerald Ford at the National Computer Conference.

In making the announcement, Afips cited Ware's international reputation as an authority on information processing, privacy and data security issues.

"Ware, who served as Afips' first president, will have the full backing of the Afips officers, board of directors and constituent societies," Afips said.

"There can be no greater concern than the preservation of human values and opportunities for individual growth in an era in which we must be on guard against the misdirected use of technology or the espousal of technological advancements for their own sake," the Afips statement said.

In addition to his responsibilities as a member of the corporate research staff at Rand, Ware served as chairman of the Secretary's Advisory Committee on Automated Personal Data Systems, Office of the Secretary, Department of Health, Education and Welfare, and was a key architect of the resulting report "Records, Computers and the Rights of Citizens."

agency modified its original proposal to omit the need for bids on the communications lines and limited bids to computing equipment exclusively.

In addition, another GSA statement issued last week said the GSA and the Department of Agriculture now are "re-viewing aspects" of a project to provide computer facilities that would serve both agencies.

In the meantime, the term "Fednet," used in GSA's first proposal, has evolved into a less "startling" term. First the name was changed to Computer Data Network. That change was further refined, and GSA now refers to the system as the "New Equipment Project," according to Baskir.

White House List Profiles Top U.S. Employees

(Continued from Page 1)

said Samuel Schulhof, deputy special assistant to the President.

The names of another 3,000 persons who have applied or have been recommended for top government jobs of the Schedule C or Presidential appointment type are also in the computer, and they too have been notified, Schulhof said.

Dorothy Glancy, a staff member on the Senate Subcommittee on Constitutional Rights, confirmed that the White House bank in question is one the subcommittee uncovered in its three-year survey on data banks.

The White House, "embarrassed" to find the file's existence made public, has been "running around" informing people about the file and "inviting" individuals to "review the information" contained in the file, she said.

In a letter signed by David J. Wimer, special assistant to the President, individuals were told:

"Due to the current concern over government data collection, I am writing to formally notify you of the computerized information kept by the White House personnel office on all full-time noncareer employees in the Federal Government. This information is kept as an incidental administrative action necessary for carrying out the constitutional and statutory

functions of the Presidency.

"The computerized data are maintained for statistical reasons. Information is listed about your position, mailing and legal addresses, age, educational and work background, and, when available, your ethnic and political background."

Locates Special Talents

The automated files on noncareer people in federal jobs and a separate list of individuals interested in federal employment helps the White House locate talent with special interests and abilities, according to Schulhof.

The data, keypunched from information on resumes submitted by the individuals involved, provides "constant visibility" and "accessibility to people whose resumes would otherwise be buried under stacks of paper," Schulhof said.

In addition, the bank provides instant access, through a CRT terminal in the Executive Office Building, to statistical information on the number of women, Blacks or Spanish surname individuals who are employed by the Federal Government. Such information is often needed for speeches or meetings with special interest groups, Schulhof explained.

The system was developed with assistance from the Office of Emergency Preparedness (OEP). The data are stored in a computer located "somewhere out in Maryland, I think," Schulhof added.

"All those people in the data bank have been notified," Schulhof said, "and those who have indicated they wished their names to be removed from the file have been removed, and their records destroyed," he said.

ACM Elects Sammet, Grosch

NEW YORK — Jean E. Sammet, IBM's programming technology planning manager, has been elected president of the Association for Computing Machinery for a two-year term beginning this June, moving up from her slot as vice-president of the organization.

Dr. Herbert R.J. Grosch, editorial director of *Computerworld*, was elected vice-president for a two-year term also, and Dr. John Hamblen of the University of Missouri was reelected secretary.

Intel Puts VS on 'Real' 360/370s

(Continued from Page 1)

put improvement, compared with IBM's EC using DOS/VS, running four application partitions and the Power spooling system on a 145.

The Intel implementations will be going into Beta test this summer and should be ready for general delivery by October.

Prices for the software will range from

\$500/mo on a 360/30, and \$900/mo on a 360/40, up through \$1,200/mo (including 7330-disk support) on a 360/65.

Software prices for either system on a 370/155 will be \$1,500/mo, while 370/165 users will pay \$1,800/mo.

Intel Data Products Group is at One Embarcadero Center, 94111.

The cost of remote data collection just became news.

Sanders' 8100 Remote Batch Terminal System can promote remote-site data entry savings from all angles. The programmable, clustered 8100 system offers 5-megabyte disk storage, source-document screen formatting and broad error-checking/editing. It eliminates card-punching, reduces CPU line charges. It simplifies, controls, standardizes, improves turnaround. The 8100 is still another answer from Sanders technology rooted in unequalled terminal-industry experience. We have the hardware, software, maintenance support — and proven reliability. Sanders Data Systems, Inc., Daniel Webster Highway-South, Nashua, N.H. 03060. Call (603) 885-3727.

Sanders...the intelligent answer

European Sales Offices: Sanders Data Systems, Ltd., 51/53 Brick Street, London W1Y 7DU, England; Sanders Data Systems, GmbH, 6000 Frankfurt/Main, Rennbahnstrasse 72/74, West Germany.



Hospital Records to Be Disclosed for Cost Analysis

WASHINGTON, D.C. — Spiraling hospital costs and the 1969 Freedom of Information Act have contributed to forcing approximately 14,000 hospitals and nursing homes participating in the Federal Medicare program to make public their computerized cost and statistical

records, the Social Security Administration (SSA) announced recently.

Donald Rubin, director of the New York-based Consumer Commission on the Accreditation of Health Services, one of several groups that requested the heretofore confidential data, said consumers

would now be in a position to scrutinize hospital records "to determine where the money comes from and how it is spent, and possible areas of waste and duplication."

In addition, Rubin said consumers would be privy, for the first time, to statistical data on operations that would put them in a better position to testify before accreditation hearings for hospitals, which are held every two years.

In response to the decision by the SSA's Bureau of Health Insurance to release this information, the American Hospital Association filed for injunctive relief in the U.S. District Court, District of Columbia. Judge William B. Jones denied the request, but delayed hearing the case until both sides submit briefs on or about June 13.

In the interim, the Bureau of Health Insurance plans to establish inquiry procedures so individuals or consumer groups who wish to obtain cost records on a given medical facility, may do so in a

routine manner, according to William Byrd, an SSA public information specialist.

Although the cost reports submitted to the SSA are budgets that represent annual operating costs for departments within health care facilities, Byrd said "figures can be extrapolated to develop per capita, prorated costs." He warned that care must be exercised in doing so, since "standard accounting practices allow for charges for hospital expenditures such as maintaining the parking lot" to be tacked onto a hospital department's budget.

In addition to the right of consumers to know how Medicare dollars are spent, Rubin said academicians and private researchers should be able to examine data on the types and frequencies, as well as the effectiveness, of treatment programs.

The American Hospital Association requested delay of the implementation of the program until it was certain that "enough safeguards were provided by the Federal Government to protect against inappropriate use of the data."

IBM Dressing 3705s for SDLC

(Continued from Page 1)

switch line security. Both functions are combined on the same card because of the space savings through the use of integrated circuits.

Some of the modifications now being implemented apply to all 3705s while others apply only to those units that utilize Type 2 scanners.

In Just 4.2 Hours . . .

The total time required to implement all of the engineering changes is 4.2 hours, while the DLC circuit card modification takes an estimated 2.4 hours to complete, IBM said. The time is required for research, installation, testing and paperwork on the part of the customer engineer.

Basic SDLC capability already exists in the scanners of all 3704s and 3705s and is described as a "standard part of the machine" regardless of whether the customer plans to use SDLC. It was more economical to include the SDLC circuit functions during factory build rather than

upgrading the devices in the field later, the spokesman explained.

While the current changes increase the SDLC capabilities on the 3705, it will take new software to implement the hardware, according to one non-IBM source. This software is expected to be released with the implementation of the Network Control Program.

The change to the 3705 is described as "transparent" to the user because the 3705 presently can only run in emulation mode. "There is currently no way to turn on the SDLC mechanism," the non-IBM source said.

UCC ONE eliminates this costly tape management hardware.



At one point under OS a hand-written notation is the only difference between a scratch tape and your master.

One slip and you could own the most expensive pencil in town.

UCC ONE (TMS) is tape management software designed to eliminate the danger. And put you in command.

It protects all of your data, even no-label tapes, against clobbering.

It provides access to real-time information, reducing a chance for error and improving your efficiency.

It offers scratch forecast lists that are automatic, not manually written.

All together it spells control in OS Leadership. And that's what UCC is all about. Call the Software Products Marketing Group at 214/637-5010 extension 3371, or write for the facts.

UCC leadership software

- ☐ UCC ONE (TMS)
- ☐ UCC TWO (DUO 360/370). Lets you run DOS under OS without conversion. Over 250 in use. Puts you in control of the change-over.
- ☐ UCC TEN (Data Dictionary/Manager). Centralizes, controls data definitions. Provides powerful cross-reference features, automatically generates data base control statements, facilitates new systems design.
- ☐ UCC FIFTEEN. Saves hours on restarting OS jobs. Simple, sophisticated software automatically corrects OS catalog, GDG biases before you re-run.
- ☐ Please send me more information on the packages indicated.
- ☐ Please have someone see me.

Name _____

Title _____

Company _____

Address _____

City/State/Zip _____

Telephone _____

UCC
UNIVERSITY COMPUTING COMPANY

7200 Stemmons Freeway
P.O. Box 47911
Dallas, Texas 75247
A Wyly Company

IBM 370's are CSA's only business.

CSA is a computer leasing company, and can help you meet your present and future equipment needs with substantial savings.

For further information, please call (617) 482-4671

**Computer Systems
of America, Inc.**
a computer equipment leasing company.
141 Milk St. Boston, Mass. 02109

Send for the 12 questions you should ask of any leasing company before you lease

Name _____

Title _____

Company _____

Address _____

City _____

State _____ Zip _____

370 on order ☐ installed ☐

Model _____ Due Date _____

SOFTWARE PRODUCTS WANTED

Well-known multi-million dollar computer systems and services company wishes to acquire proprietary software product. Application emphasis should have accounting or financial orientation.

Preference will be given to product already demonstrating proven sales but consideration will also be afforded to generalized products that are suitable for marketing. Operation on an IBM 360/70 is essential.

We will consider either acquisition of the software or of the entire company. Kindly respond in confidence to:

CW Box 4113
797 Washington St.
Newton, Mass. 02160

Going VS? You need QCM.

You need accurate and continuous measurement of the VS paging system. QCM is the only performance evaluation program that can do it. QCM (Quantitative Computer Management) is fully operational with IBM VS Operating Systems.

You need precise measurement of all productive and overhead processing. QCM does it.

You need significant performance improvement. QCM's Regulator does it . . . automatically.

You need accurate and useful job accounting and computer performance evaluation data. QCM delivers this . . . and much more.

If you're going VS you need QCM. If you're staying OS you need QCM, too. Let us prove it.

Fill in and mail the coupon or call:

DUQUESNE SYSTEMS INC

1511 Park Building
Pittsburgh, PA 15222
412/281-9055

I'd like to know how QCM can bring control, efficiency and savings to our
☐ OS ☐ VS Systems.

Name _____
Title _____
Organization _____
Address _____ Telephone _____
City _____ State _____ Zip _____



Core Expansions for the Cost Conscious

If you need to expand the core capacity of your System 360 and you're concerned about cost, take a look at SMART® 360 Core from Standard Memories.

360-30 EXPAND TO 512 KBYTES. Available in all standard sizes. Price to expand from -30E to -30F is under \$11,000.

360-40 AVAILABLE TO 448 KBYTES in standard increments. Price to expand from -40G to -40H is less than \$22,000.

360-50 UP TO 1 MEGABYTE in standard sizes. Price to expand from -50H to -50I is under \$42,000.

For more information, detailed specifications or firm quotation, call:

EAST: Frank Genovese, 201/842-3160
MIDWEST: Ron Brecker, 612/890-8838
WEST: Milo Cordero, 714/540-3605
or write to:

STANDARD MEMORIES

INCORPORATED

AN APPLIED MAGNETICS COMPANY

2801 E. Oakland Park Blvd., Ft. Lauderdale, Florida 33306
TWX 510-955-9828 Telephone (305) 566-7611

Calif. DOJ Opposes Proposal For Dedicated Justice Systems

By Marvin Smalheiser

CW West Coast Bureau

SAN FRANCISCO — The establishment of dedicated systems for criminal justice information systems was opposed here by the California Department of Justice (DOJ) at hearings on proposed federal regulations concerning security and privacy.

The hearings were held by the U.S. Department of Justice to get West Coast views regarding the proposed regulations.

Deputy Attorney General Michael Franchetti of the California DOJ said: "The practical facts of life, in California at least, make the implementation of a dedicated system virtually impossible and unworkable."

Franchetti said a dedicated system would "undo the progress which has been accomplished at the local level" in the state, adding it would be financially beyond the reach of local governments to automate criminal justice information systems.

'Serious Impact'

"Any restriction which is designed to require the independent maintenance of a law enforcement or criminal justice computer center would have such a serious fiscal impact upon locals that it would in effect require them to cease using the centers for criminal justice functions," he said.

As an alternative, Franchetti suggested the overall state system be dedicated and the state establish proper standards for security and privacy for local systems.

Franchetti said the proposed federal regulations were ill-timed in view of the legislation on privacy and security now pending in Congress.

He also noted that "it would be almost

impossible for [states] to completely comply with a July 1976 deadline."

Franchetti expressed concern about "vague" proposals regarding record sealing.

"We believe in some situations, the public interest is served by allowing a non-criminal justice agency to have access to criminal offender information. This often requires full access to such information, including arrests which do not result in convictions," he said.

As an alternative to the concept of record sealing, "We suggest that the regulations require agencies to determine the useful life of criminal records. Once useful life has been determined a purge or sealing system similar to that adopted in California could be implemented," Franchetti proposed.

Under such a system, no one would have access to information after the passage of time has rendered its value minimal.

"Noncriminal use of such information should be restricted to agencies specifically authorized by statute."

Judge James L. Smith of Orange County Municipal Court also testified at the hearing and similarly argued that dedicated criminal justice information systems would be financially impossible for local governments.

Shared systems, he claimed, do not create greater security or privacy problems.

The key, he said, is personnel and proper safeguards to see that their backgrounds have been checked.

Smith asked that the U.S. Justice Department temporarily withhold action on its proposed regulations until the pending state and federal legislation on the subject has been stabilized.

Maintenance of Crime Data Needs Proper 'Checks and Balances'

CW West Coast Bureau

SAN FRANCISCO — Conflicts between security and privacy could be harmful not only to individual citizens but to the systems themselves. Richard W. Velde warned more than 1,000 persons at a meeting on criminal justice systems.

Velde, deputy administrator for policy development, Law Enforcement Assistance Administration (LEAA), expressed the hope for clear congressional action soon to resolve the issues of privacy and security.

"Currently, there is uncertainty and confusion as to what can be done. Congressional action is imperative at an early date or the orderly expansion of criminal justice systems may be impeded."

Velde said, "Criminal justice information must be maintained and exchanged only within a framework of appropriate checks and balances."

"Government's duty to protect individuals from violence and crime must be balanced against society's responsibility to protect personal privacy."

On the opening day of the meeting, which was sponsored by LEAA and Project Search, a panel discussion on security and privacy legislation and regulations was featured.

During the discussion, Archibald Murray, commissioner of Criminal Justice Services, New York, proposed a framework of boards to regulate the operation of criminal justice systems.

Murray said there is "an overriding need to create a nationwide framework to avoid chaos and to insure fairness in the use of information."

He said a series of independent and prestigious regulatory boards at major levels of government, representing affected communities of interest could be created to insure that the systems are operated fairly.

He emphasized the criminal justice systems must be operated fairly and he defined fairness as being objective and operating in a nonarbitrary fashion.

The board, he said, could be constituted with representatives of the Federal Government, state government and the public, each interfacing as checks and balances.

Mark Gitenstein, counsel for the Senate Subcommittee on Constitutional Rights, described the privacy bill proposed by Sen. Sam Ervin (D-N.C.), conceding it

Related story on criminal justice systems on Page 8.

was weighed in favor of personal privacy and contained sections intended to provoke controversy in the criminal justice community as a way of resolving the issues.

He also said none of the major issues is irreconcilable.

Mary Lawton, deputy assistant attorney general, Office of Legal Counsel, U.S. Department of Justice, described major differences between the Department of Justice's proposed privacy bill and Ervin's bill.

She stressed that the Justice bill set minimum standards for privacy and said it is "too late for a piecemeal approach by federal, state and local agencies."

It was announced at the meeting that in June, Project Search will become an independent nonprofit corporation, continuing its research and development in applying advanced technology to criminal justice.

It will be composed of representatives appointed by the governors of the 50 states.

The project coordinator will be O.J. Hawkins, assistant director of the California Department of Justice.

Research vs Administrative Uses at Issue

Rutgers Battles N.J. for Control of DEC PDP-10

By Toni Wiseman

Of the CW Staff

NEW BRUNSWICK, N.J. — A political battle is brewing here over the control of a computer. The state of New Jersey and Rutgers — the State University — both want to control a new system on order.

On April 1, the university announced it was going ahead against standing state policy in the purchase of a DEC PDP-10. The state has notified university officials that it must turn over management control of the new computer to a state computer organization, the Education Information Services, Inc. (EIS).

The political implication, according to a Rutgers spokesman is that the university has gone ahead with the transaction without the permission of the state, "because we're making the argument that computers are as vital to a university in the last half of the 20th Century as a library was in the first."

Who Can Own Computers?

"We simply cannot accept the fact, which the state is arguing, that only the state-created EIS can own computers," the spokesman said. "We're willing to be part of the EIS for administrative computing but not for academic research computing."

The university position is that EIS has a role, but that it is not going to do everything, according to Eugene Young, assistant vice-president for academic affairs.

"The university feels EIS can do a very good job in coordinating academic computing and software developments and we support the use of EIS for administrative work where a large data base kind of operation can reside in a big computer," Young said.

"However, when you get to certain kinds of computing, what we call computing for research or advanced time-sharing, where the use of the computer is very unique and special," Young stated,

"we feel the computer is better under the control and operation of the university."

"It is more of a research tool for the university than the utility concept of a computer out there grinding away doing all kinds of general-purpose work," he added.

"Basically what we're arguing about is operating control," the university spokesman said. "We feel management control of the computer has to be within the university, available to our researchers."

There are also some arguments about the way the computer is to be programmed. The EIS does general purpose computing, largely administrative in nature, the Rutgers spokesman noted, and "we want this programmed for very, very sophisticated research computing — and it can't do both."

Paid by Federal Grants

One university argument for retaining operating control is that the PDP-10 is

being paid for largely through federal grants, specifically from the National Institutes of Health (NIH). "And we have letters from them indicating they agree it has to be programmed our way," the spokesman said.

"What the state is saying is that even

"We're making the argument that computers are as vital to a university in the last half of the 20th Century as a library was in the first." — a Rutgers University spokesman

though we get the grant, they're going to assume operation of the computer, despite the fact that a federal agency has indicated they would prefer us to operate it."

Young stated that in the past, Rutgers has had over \$700,000 worth of research

computing grants from NIH and the Advanced Research Projects Agency (Arpa), and now has additional grants of \$1.2 million from NIH to continue work in the area of biomedicine, and \$400,000 from Arpa to work on the security of large data base systems.

This, he said, is where the problem comes in — half the funds for the computer are from grants and the other half from the state.

"We've tried to meet this problem by saying, 'Yes, indeed, there are other people in the state of New Jersey in other institutions who could use the computer,'" Young said.

"And we would be glad to have them use this resource, but for advanced time-sharing. We don't want to get the computer cluttered up with a lot of beginning level users, or people who are going to sop up the time so it isn't available for the primary purpose as we see it."



InFOREmation

MAMARONECK, N.Y. — Spectators at the U.S. Open Golf Championship June 13-16 will have an opportunity to ask a computer for help in analyzing the action. Here, Edward T. Schneider, general chairman of the 1974 U.S. Open, views one of the six IBM 3270 information display stations located at key points on the Winged Foot Golf Club course here. Each station housing two 3270s will provide the gallery with up-to-the-minute reports on the leaders and how their scores compare with par.

Aided by operators, spectators will be able to receive nearly 50 types of statistical information to analyze players' putting and driving skills and to assess the degree of difficulty of various holes. Data on tournament play will be telephoned to the computer as soon as players complete a hole, insuring that screen displays remain current with the actual play.



We Get Along With Everyone

INCOTERM® SPD® 900 Remote Batch Terminal Systems are compatible with practically every major terminal . . . whether batch or interactive. This fanciful keyboard illustrates the point.

Not fanciful, however, is INCOTERM versatility. You can select 2780, 3780, and 2740, 360/20 and 2265, 1004 and Uniscope 100, 200 User Terminal and Series 710. Interface with a combination of service bureaus and CPU's.

Read cards at 150 or 300 cpm. Print at 200 or 400 lpm. Communicate at rates from 1200 to 4800 baud. Store up to 500,000 bytes on the optional SPD Diskette.

Use the SPD 900 for remote batch processing . . . and for order entry, remote job entry, file inquiry.

Call or write:



INCOTERM CORPORATION

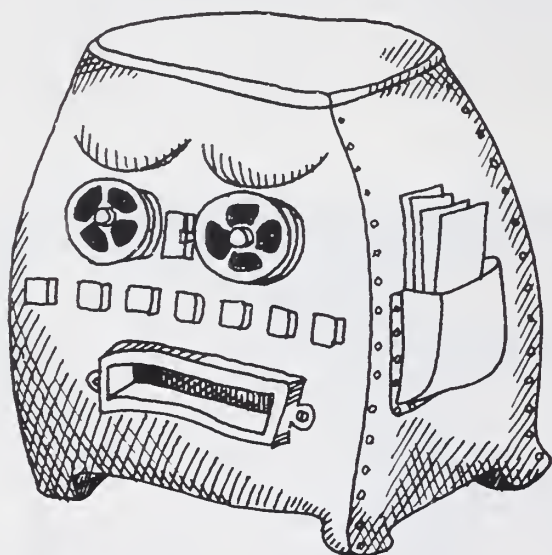
6 Strathmore Road • Natick, Massachusetts 01760 • (617) 655-6100

INCOTERM Sales Offices:

Atlanta (404) 294-7588 • Boston (617) 655-6100 • Chicago (312) 593-2230 • Dallas (214) 634-2600 • Los Angeles (213) 640-0328
New York (212) 541-5780 • Orlando (305) 894-2605 • Pittsburgh (412) 921-4667 • San Francisco (415) 697-3643
Seattle (206) 682-7597 • Washington, D.C. (703) 524-8610 • Uxbridge, U.K. 31913-4, or London, U.K. 01-841-85-25

would you let an employee loaf on the job?

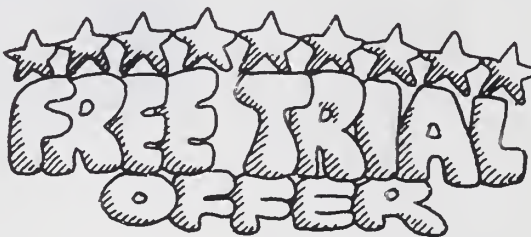
what about your computer?



It's not always easy to see when your computer isn't pulling its weight. But now you can. Through our new **Computer Utilization Program**.

We designed this program to help you get the most out of your computer hardware and software investments. It will report on computer utilization in terms of memory, CPU, terminals and peripheral devices; job classes, priorities and initiators too. The result can help you identify bottlenecks in your processing... pinpoint high and low utilization periods... and help you decide when to change hardware or software to improve service.

Cost for the Computer Utilization Program is just \$3000. And it can pay for itself in savings, many times over, in short order. To learn more about the Computer Utilization Program send us the coupon. Or, better yet, to learn what it can mean to you, take advantage of the free offer described above.



Here's all you do:

1. Send us a recent SMF tape, covering at least a week of operations... (send via UPS or insured air parcel post.)
2. We'll process it free and return it... along with a set of reports on how your system is using its resources.

How much can our Computer Utilization Program help you? Neither of us can know until you send us your SMF tape. Send to Lou Pfeiffer/A. O. Smith Corporation/Data Systems Division/8651 N. Port Washington Rd., Milwaukee, Wisconsin 53217.

To: Lou Pfeiffer
A. O. Smith Data Systems
8651 N. Port Washington Rd.
Milwaukee, Wisconsin 53217

Please send me additional information on the
Computer Utilization Program and its reports

Name _____

Title _____

Company _____

Address _____

City _____

State _____

Zip _____

A. O. Smith

DATA SYSTEMS DIVISION

Developing Nations Seen Major Market For Justice Systems

CW West Coast Bureau

SAN FRANCISCO — The developing countries represent an important market for crime data systems, according to William Clifford, assistant director of the United Nations Crime Prevention and Criminal Justice Section.

Clifford cautioned, however, that in dealing with the developing nations it is important not to use "an earthquake of methodology to move a stone of information."

It is necessary to relate the crime data system to the amount of crime and the degree of insecurity of the people, he said.

"A simplified system is preferable for a developing country," he noted.

Clifford spoke at the second international symposium on criminal justice information and statistics sponsored by Project Search.

Expanding the Scope

He told the more than 1,000 persons who attended of the need to give a third dimension to crime data systems — an international dimension.

Albert G. Bergesen, regional U.S. commissioner of customs, Los Angeles, proposed an international clearinghouse for the exchange of information on known and potential terrorist groups and their members.

He said the National Central Bureau of Interpol in each participating country has been given the task of securing this information and added the exchange of the information should be "vigorously pursued to ensure its availability to all participating countries."

They're Doing It

Alfons Wahl, federal prosecuting attorney for the West German Supreme Court, told of the centralization of criminal data files by the Federal Office of Criminal Police there.

He said there are now about 600 computers used by the 11 West German states and there are plans to tie them together.

It has not been decided, however, whether all information will be in all computers or merely accessible from one place, he said.

The parliament, Wahl said, is now discussing a proposed law which would introduce a lifetime personal index for each person.

Statistics about crime are compiled annually and integrated and made public. A new computer center is being established for federal penal records, he said. It will be fully established and working within the next two or three years, he added.

data exit

It's what you get out of the computer that counts.

Data entry gets a lot of attention these days. What about data exit? Getting what you want out of a computer. Using information *creatively*.

The key to data exit is The Data Analyzer. It's the most powerful retrieval/reporting system available. As simple or comprehensive as

your needs require. There's an English-like language anyone can use and procedural languages to let you modify and add to the system as you wish. It presents data in a variety of graphic as well as conventional forms. And interfaces with data base systems like IMS and TOTAL.

Find out more at one of our free morning seminars in your area. Let us show you what data exit is all about. Check the city and send in the coupon today!

Program Products Incorporated
20 Old Turnpike Road
Nanuet, N.Y. 10954
914-623-6868

<input type="checkbox"/> Atlanta	6/4	<input type="checkbox"/> Indianapolis	6/12	<input type="checkbox"/> Pittsburgh	6/11
<input type="checkbox"/> Baltimore	6/6	<input type="checkbox"/> Kansas City, Mo.	5/23	<input type="checkbox"/> Portland	5/15
<input type="checkbox"/> Buffalo	6/13	<input type="checkbox"/> Los Angeles	4/17	<input type="checkbox"/> Raleigh, N.C.	6/4
<input type="checkbox"/> Charlotte, N.C.	6/6	<input type="checkbox"/> Miami Beach	6/6	<input type="checkbox"/> San Diego	5/16
<input type="checkbox"/> Chicago	6/19	<input type="checkbox"/> Milwaukee	6/20	<input type="checkbox"/> San Francisco	4/18
<input type="checkbox"/> Cincinnati	5/8	<input type="checkbox"/> Minneapolis	5/22	<input type="checkbox"/> Seattle	5/14
<input type="checkbox"/> Cleveland	6/12	<input type="checkbox"/> Montreal	5/9	<input type="checkbox"/> St. Louis	5/21
<input type="checkbox"/> Detroit	5/15	<input type="checkbox"/> New York	6/12	<input type="checkbox"/> Toronto	4/24
<input type="checkbox"/> Greensboro, N.C.	6/5	<input type="checkbox"/> Philadelphia	6/4	<input type="checkbox"/> Washington	6/5
<input type="checkbox"/> Hartford	5/23	<input type="checkbox"/> Phoenix	5/17		

☐ I wish to attend your seminar in city indicated.

☐ Please send more information.

Name/Position _____

Company _____

Street Address _____

City/State/Zip/Telephone _____

The Data Analyzer

Acpa Debates Pros and Cons

Is DP Certification Necessary?

By Patrick Ward
Of the CW Staff

CHICAGO — "The impact of DP on society today makes it desirable for those who are responsible . . . to establish themselves as professionals with professional standards," Fred H. Harris, director of the University of Chicago's computational center, declared at a recent certification debate.

During the debate, sponsored by the Chicago chapter of the Association of Computer Programmers and Analysts (Acpa), Harris argued for extensive certification of DP personnel.

He also advocated both improving the existing CDP exam, which is directed at business-oriented DP at the management level, and adding new exams to cover other areas.

But Ronald G. Stewart, systems development director at the university, took the "devil's advocate" role: "Certification is not necessary," he countered. "It does not protect the public . . . it does not tie in with on-the-job performance."

Besides, certification is discriminatory, Stewart said, since present certification tests "favor people who have been successful in the conventional academic environment."

The test is intended to be discriminatory — "between those who know or don't know," Harris replied. While there are cultural biases in tests, it is possible to remove them, he added.

Sociologists classify a group of workers as professionals, Harris said, if they share "a high degree of generalized and systematic knowledge," if their "primary orientation is to the community interest," if they show "a high degree of self control of behavior," and if they have "a system of rewards that is primarily a set of symbols of work achievement."

Not Professionals

"Under those four items I don't think we qualify as professionals," Stewart rejoined.

Passing the CDP does not make the DPer a professional, he said.

Instead, "responsibility towards ourselves and our employers is the first step towards true professionalism," he contended.

But a uniform testing process is needed, Harris stated, "to provide any person trying to enter the field a chance to establish his credentials."

But Harris pointed out that certification only establishes that "the person has the essential knowledge, not that he is competent to apply that knowledge."

Some sort of internship with a "master" who can observe the younger person's ability could measure competence, Harris suggested.

And a combination of certification and internship might someday be a prerequisite of licensing, he remarked.

A certification test is not enough, added Kenniston W. Lord Jr., the only CDP holder in the group. Lord, vice-president of Ware Associates and president of the Society of Certified Data Processors, said "until we can throw people out of a profession, we can't call it a profession."

Lord sees a need for a local control authority, much like the legal bar association that would have both a code of ethics and the power to remove a DP practitioner's license.

Stewart observed that the legal profession's certification efforts have not protected the public from bad lawyers.

Service to Management

Besides, DP people's work is "basically a service to management," he said. "If certification is necessary, certify the managers" who hold the real authority, Stewart urged.

Harris disagreed with Stewart. "Increasingly many of the buildings we live and work in are designed by automated systems," he said.

"The professional engineer is not equipped to judge whether he's dealing with a trustworthy program. It is important that such programmers be certified," Harris said.

In the future, Harris added, "you'll find systems like credit, payroll, automated banking systems . . . that will be audited."

**370/155 I
WANTED
FOR 1 YR. LEASE**

- Will Pay
High Rental
- Installation
Within 60 Days

CW Box 4115
797 Washington St.
Newton, Mass. 02160

bright
idea

from
Transdata...

We MATCH
the computer to the need!

Want to BUY, SELL, LEASE OR TRADE computers or peripherals? Then you'll be dollars ahead working with a professional data processing dealer. Our experience and professional service will take care of your exact needs . . . and save you money in the process. (Up to 40% on IBM equipment.)

Let us shed more light on the subject. Call Tom Norris collect at (214) 631-5647.

transdata CORPORATION
P. O. Box 47762 Dallas, Texas 75247

Members of Computer Dealers Assoc.

DATA CENTER USERS

**Cut your bill IN HALF
without changing data centers!**

If you are running under IBM OS or OS/VS with programs written in COBOL and/or ASSEMBLER, the use of SYNCPAC will enable you to achieve SUBSTANTIAL SAVINGS at your data center.

SYNCPAC is a proven, operating parallel-processing monitor that combines a multi-step job into a single step. Installation is *less than one day*.

For more complete information and a no-cost, no-obligation trial of SYNCPAC — at your data center — on one of your existing OS Job Streams, call: [617] 527-1426.

THE SOFTWARE GROUP, INC.

Sales and Service Representatives of Software Packages

233 Needham Street, Newton, MA 02161 — Telephone [617] 527-1426

**CIS has \$15,000,000
available for lease
financing on 158's**

with 7 to 8 year lease terms, between now and June 30th.

If your delivery date is beyond June 30th, CIS can help you take advantage of attractive rates (e.g. less than 60% of IBM MAC) and deliver your 158 in June. CIS has seven 158's available.

Remember, Price Increases are imminent, and CIS has \$15,000,000 available now -- use it -- and CIS.

**CALL COLLECT
315-474-5776**
RICHARD J. CAMPBELL
OR FRED P. CHOLETTE

**CONTINENTAL INFORMATION
SYSTEMS CORPORATION**
MIDTOWN PLAZA
700 EAST WATER STREET
SYRACUSE, NEW YORK 13210
PHONE 315-474-5776
TELEX 93-7435

CIS
CONTINENTAL INFORMATION
SYSTEMS CORPORATION

Editorials

The Forgotten Challenge

While the computer community has been almost tripping over itself to respond to Vice President Gerald R. Ford's call for help in formulating standards and safeguards in the area of personal privacy and data bank systems, an equally serious challenge has gone almost without comment.

The challenge — to improve the professional skills of the people in the computer industry — was issued by George Glaser, president of the American Federation of Information Processing Societies (Afiips) at the National Computer Conference.

There is significant reason to worry about the "quality and quantity" of professionals in this business, and Glaser was right on the mark when he stated the ability of users to undertake "more ambitious projects and thereby solve more complex problems" could be limited by this lack of skilled manpower.

Perhaps national figures are heeded more carefully than are those from our own industry. Certainly Ford's rather bland speech on privacy has elicited more comment than Glaser's clarion call for reform in the training and professionalism of DP personnel.

But the real reason for ignoring Glaser's comments may be even more subtle: perhaps we don't like to be reminded of our shortcomings.

It is time, however, for users and industry alike to begin taking a hard look at the growing "people problem" of our profession.

As computer systems increasingly impinge on the quality of everyday life, the computer community will be called upon to guarantee the effectiveness and efficiency of those systems.

And without skilled manpower, computer users will not be able to meet those guarantees, which could cause a well-deserved backlash against computer use on the part of the public.

No longer can we hide from this responsibility — it is time for action now.

Which only makes it more disheartening that Afiips, the organization headed by Glaser, has virtually ignored his pleas, while "enthusiastically accepting" Ford's call for help in the privacy area.

Afiips is the one organization which could have a profound influence in the area of professionalism and it should begin planning immediately for ways in which to meet the challenge Glaser so forcefully placed before it.

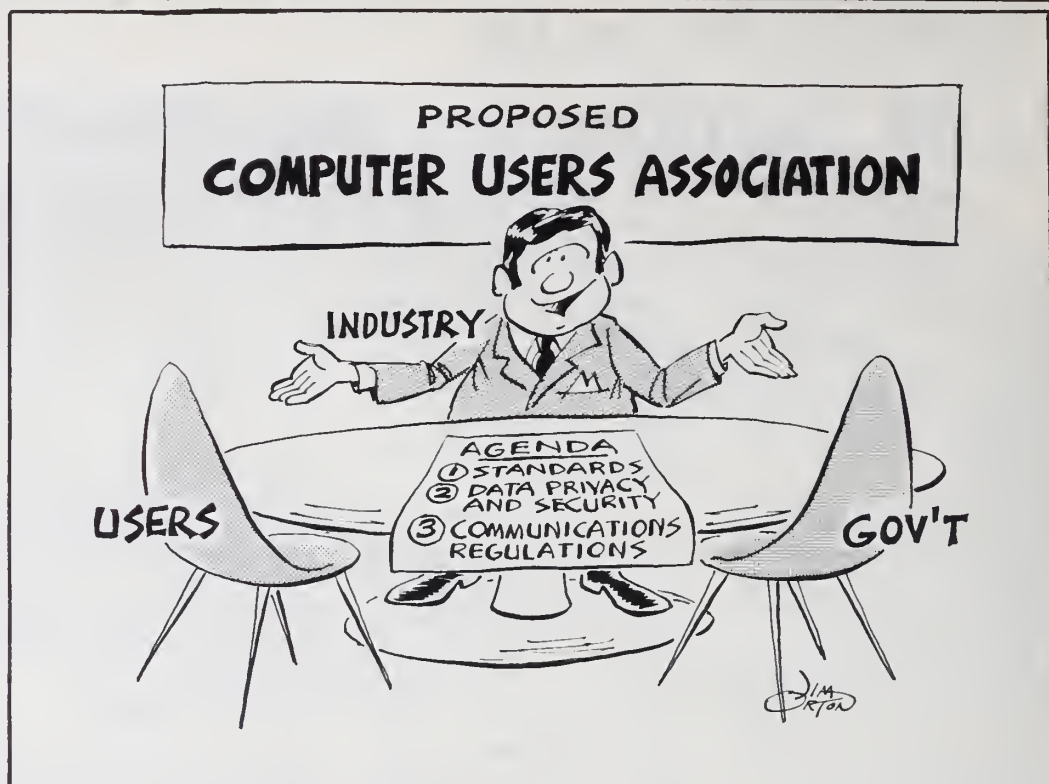
Breath of Spring

Over the last two years, independent vendors of peripherals have caught up with IBM. New development and new practical technologies perfected for the end user of IBM CPUs appear to be in a "holding pattern" awaiting the arrival of FS.

But the independents are not wasting their time. Honeywell and Univac installations are now in the independents' sights. Breakthroughs in electronic interfaces will soon provide widespread adaptability of IBM-type peripherals for non-IBM users.

Already tapes and disk drives are popping up for Univac and large DEC CPUs, and recently Cambridge Memories began a legal battle to stop Honeywell from refusing to maintain its part of a system with independent add-on memories.

The net effect of this increased competition will surely give Univac and Honeywell users more freedom of choice and better cost-performance equipment. The next two years will be "spring" for the independents and what remains of the seven dwarfs.



'Time's-a-Wasting, Gentlemen!'

It's Good Business, Not Arrogance, To Refuse Unlimited Contract Liability

By Robert A. Bucci

Special to Computerworld

Alan Taylor's report "New-Style Computer Selection Cuts Work, Helps Results" [CW, May 1] unfairly accuses IBM of arrogance for attempting to disclaim implied warranties and exclude consequential damages in its negotiations for a model contract with the U.S. Government. IBM in essence took the position any responsible manufacturer/vendor would, namely, that it will not accept unlimited liability in its dealings with the government. Now what in the world is so arrogant or strange about that?

The business issue is very simple. Does the net profit a manufacturer will realize on the revenue from a particular transaction justify the undertaking of an unlimited exposure. No way! As a matter of fact I would wager that every mainframe ven-

dor has refused commercial contracts rather than commit to open-ended liability. And rightfully so.

The normal warranty extended by manufacturers of commercial products is to repair or replace defective products within the

Viewpoint

warranty period, but in no event to accept liability for special or consequential damages. In addition, many state that regardless of the form of claim brought against them, liability cannot exceed the total amount of money paid by the customer for the product or service. IBM is no different.

The point I am trying to make is that it is reasonable to limit liability, it is arrogant to *exclude all liabilities*, and that IBM acted

reasonably in this instance.

The U.S. Controller General who was "aware of no statutory or regulatory provision which requires the user to disclaim implied warranties and exclude consequential damages," obviously hadn't heard of the Uniform Commercial Code (which allows sellers to disclaim implied warranties and exclude consequential damages). But then again I wouldn't expect him to have heard — it's only in effect in 49 states plus the District of Columbia!

Section 2-316 of the code permits the disclaimer of the implied warranties of merchantability or fitness. Furthermore, 2-719 of the code states consequential damages may be limited or excluded where the loss is commercial in nature, i.e., a non-consumer-related transaction.

Section 15.1 of the revised draft of the Standard Request for Proposal for ADPE which is circulating throughout the industry provided in part that "... except for the implied warranty of merchantability, there are no warranties expressed or implied. In no event will the contractor be liable to the government for consequential damages as defined in the Uniform Commercial Code, Section 2-715 in effect in the District of Columbia."

It appears the government's current posture to seek half a loaf, i.e., no disclaimer of implied warranty of merchantability allowed, but consequential damages excluded.

One final point which Taylor neglected to mention is that the government takes pretty good care of itself contractually. It has many protections such as acceptance tests, performance tests, liquidated damages, equipment malfunction credits, etc., which the average user would give his eye teeth for. I find it very hard to reach for my government crying towel.

Robert Bucci is a member of the New York and Massachusetts Bars, and is a former legal counsel for Honeywell Systems, Inc.

Letters to the Editor

Good Operator Saves Time and Money

As I read Joseph T. Rigo's viewpoint article in the May 8 issue, I became very angry. In the fifth paragraph he intimates that computer operators are a lowly group of employees.

Not so, I say. A good computer operator can save his company money and wasted computer time by not letting some tests and compiles run; by going to programmers and seeing if they really need that 70,000-line printout; by checking production jobs that do not appear to be right.

I've been in data processing for 27 years. I can assure you computer operators can contribute a great deal to a DP section if you give them half a chance. We have an insight into the work no one else has.

Jerry Gaiser
Computer Shift Supervisor
Salem, Ore.

Grosch Enlightening

Herb Grosch's acerbic comments provide an incisive breath of fresh air that tends to edify far more than infuriate. A pertinent example is his rebuttal in the May 8 issue on the Arpanet. This is suggestive that some space be devoted to in-depth, background articles on such things as the Arpanet and Illiac IV, their cost to us and prognosis as to their utility.

Richard L. Coleman
Bedford, Mass.

Computerworld welcomes comments from its readers. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

Other letters, viewpoints on Pages 11 and 12.

Solving Social Problems by Computer—Part III

Dangers Inherent in 'Computer Said So' Conclusions

The following is the third part of a series based on a speech given at the New York Academy of Sciences Oct. 9, 1973.

By Daniel McCracken

Special to Computerworld

One particular computer application that is ethically undesirable in my view is the Club of Rome project carried out by Jay Forrester and some of his colleagues at MIT. This work was originally reported in Forrester's book *World Dynamics* (a popularized report came out as *The Limits to Growth*). The project uses computer simulation methods to attempt to predict the future course of world events in terms of such variables as population, land use, capital investment, pollution, birth and death rates and quality of life.

The Limits to Growth arrives at unremarkable conclusions that are probably true, via calculations that have unknowable validity.

The total content of the book can be summarized thus: exponential growth in the use of finite resources must eventually lead to drastic and probably disastrous results. There is no other intellectual content. The elaborate computer runs prove nothing whatever, or if they do, it is by accident, with the input parameters having been adjusted to give results that match the investigator's guesses as to what will happen. There is no hard data anywhere in the study.

Assumptions Suspect

The world dynamics model consists of a system of simultaneous differential equations, with the solutions approximated by difference methods. I have no quarrel with the mathematics, and have not heard of anyone else who criticizes that aspect of the study. The problem is with the assumptions and the "data."

The "World Model Standard Run" graph that appeared in so many news-

papers shows world population rising to a peak somewhere around 2040, then falling precipitously. Four factors affect birth and death rates in the model. In no case is there any data with which to argue, only bland assumptions.

If "material standard of living" fell to zero, would the death rate rise by a factor of 3.0, as assumed, or 3.5, or 1.7 or what? Who could possibly know? Were death rates in India compared with death rates in Canada, say, to try to get some solid facts to go on? It would seem not.

Or take death rate and food famine. The

Viewpoint

model assumes that if worldwide food supply fell to one-half, the worldwide death rate would double. That is highly questionable. In places where the daily caloric intake is already below subsistence, on the average, halving the food supply would kill almost everybody; in the U.S., where we eat many hundreds of calories more per day than we need, then go to reducing salons to take it off, halving the food supply might actually increase the life span of some people.

But never forget that the model aggregates the whole world; rich fat America is part of the "death-rate-and-food" multiplier on exactly the same basis as is wretchedly poor Bolivia. A life span of 70 in France is lumped with a life span of 33 in Haiti. Ethiopia, with 72,000 population per doctor, is lumped with the U.S., with 650.

Or take birth rate and crowding. It is part of the calculations leading to the widely published figures, that an increase of 2.0 in crowding would decrease the birth rate by 10%. Who can even say that

the sign is right on that one? The birth rate in crowded India today is surely not less than that in sparsely populated Canada.

Or take my favorite, birth rate and pollution. The calculations here are based on a carefully constructed table that plots the birth rate as a function of pollution, neatly stated for pollution multipliers ranging from zero times today's pollution up to 60 times. At 10 times today's pollution, the effect of this factor on birth rate would be to lower it by 10%, but at 20 times today's pollution, the effect would be to lower birth rate by 30%! How marvelously precise! How seemingly factual! How, in fact, meaningless!

Who knows? It has been suggested that if one of the oil supertankers were carrying certain kinds of insecticides and broke up on the high seas, it conceivably could kill all microscopic ocean life, stop most oxygen production and thereby kill us all. Yet worldwide, that would be only a tiny fraction of a percent increase in pollution.

And never forget the aggregation. A vast increase in pollution in the four corners region of the Southwest, uphappy as that situation is, will have a negligible effect on life spans. But a similar increase in the Los Angeles basin could kill hundreds of thousands.

If a group of people do some highly questionable work involving a computer, and come up with some results that are not implausible even though their methods offer almost no support for the conclusions, what of it? Who has been hurt? And if it alerts people to dangers, isn't it a good thing even if there is no intellectual content?

Voice of Authority

The problem is the syndrome that goes,

"The computer says." The news stories on the Forrester/Meadows work made much of the fact that "the computer said so." And that is inherently dangerous, because once that point of view is widely accepted *anything goes*. Somebody else could come up with a model next year, claiming to have proved that disaster is seven centuries away, not 70 years, and everybody would believe that, too, if it came out of a similarly prestigious school.

Despite the fact that almost any kind of foul-up in credit card billing can be blamed on the computer, there is a simultaneous blind faith in what "the computer says." I almost wish that some really big project would fall on its face in a big, public way; I think the collective mental health would be the better for it.

In summary, then: *Limits to Growth* reaches plausible conclusions, perhaps because its developers played with the input until they got results that seemed likely to them. It has no basis in factual data or defensible intellectual framework. Its major faults are the grossness of its level of aggregation and the offhandedly casual assumptions that go into its statements of causes and effects.

It is dangerous, not because it is wrong — no one can say whether it is or not — because it is so widely believed to be accurate just because a computer is involved. With a great deal more work, there might be some valid results from it; there is no good way to judge that at this stage.

Part IV concludes the series with some advice for those contemplating social applications.

Daniel McCracken is the author of a dozen textbooks on computer programming and an observer of the social problems associated with computer technology.

Where Is Your Site in Proposal 'Pecking Order?'

Last year a few Taylor Reports dealt with the problems that occur when a computer proposal contains promises that are later either unfulfilled, or simply brushed to one side. The question was: Who was responsible? Proposal responsibility was not then a new topic, and indeed the lack of strong relationships between computer contract terms and computer proposals has been a running sore for the past decade.

The 1973 arguments seemed to be based on some form of moral terminology. Some argued that the proposal should always be strictly enforced — others said anyone who believed a computer salesman (even in writing) was a fool who deserved what he got. From the legal side came the argument that it was necessary for the proposal to be disowned by the contract, because of the great dangers of ambiguity, and even contradictions in the proposal.

Since last year, however, there have been a number of further ideas put forward, based not on the special characteristics of computers, but on the basic facts of U.S. law. These suggest

that a new user pecking order should be recognized when selling computers, and that the question originally asked, "Who is responsible when the proposal is not met?", has, since the last technological jump in computers, developed a really important set of meanings.

Computers nowadays are being sold to smaller and smaller firms as well as to larger ones. In the old days, when a firm was thinking of buying a computer, the size of the investment was such that they always put people on their staff who had some knowledge of computers. Now, this is not necessarily so. Now, it is quite possible, and in fact being recommended by computer manufacturers, to rent computers without having anyone on the staff or in the firm itself with DP knowledge.

From a legal point of view, it appears that the question of the truthfulness of the proposal in such cases may well be different than in cases where there is a DP department qualified to understand the problems that may be encountered. The 1974 proposal reliability pecking order, therefore, from the point of view of getting or being able to rely upon proposals, apparently ranks the people without a DP department one higher than those with one. To be precise, it reverses the usual computer pecking order, where the larger the DP department, the more consideration you get.

Additional duties may lie with

the computer vendor in another area: their knowledge of the problems of recommended applications. Basically, if a computer vendor comes in suggesting an application, or a mode of operation, which the vendor knows much more about than the user, then again the right to disown the promises in the vendor's proposal can be held up to question.

As before, if the user *does* have information available to him about the application's dangers, matters may be different — but in the meantime the vendors' salesmen will be well advised to scrupulously provide the most reliable information possible, because again, a customer without the information, is a *priority customer*, not just someone who can be conned with the latest details of the wonders of management information systems.

As well as providing information, there is also the question of concealing adverse information about an application or a machine configuration. For instance, if the machine is known to be liable to break down, and if the vendor has this information but knows the user does not, it is good policy — and probably more than good policy — to bring matters out fully rather than let the user go on in ignorance and sign up for the hardware. Again, the holding of special knowledge by the vendor makes the particular user a *priority customer* for the supply of information, even about defects of the equipment.

Finally, if after the contract is signed the vendor discovers there are going to be problems in meeting whatever it has agreed to, and fails to tell the user very straightforwardly about the problems, the vendor can be considered at fault.

In particular, in one computer case where the vendor proceeded to suggest that the faults causing the problems were with the customer, then even if the original contract was all right, the vendor was held responsible.

A typical way in which this could impact computer selling, for instance, would be when the vendor reports the installation staff not being "cooperative," or perhaps even not competent, when in fact the major problem is that something unexpected has gone wrong with the ven-

дор's hardware or software support.

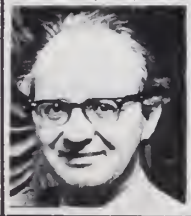
So, the 1974 answer to the problem of who is responsible when the proposals are not met, seems to be that it depends upon just how far up in the legal pecking order your installation is.

To see how far up you are — take the quiz below. Hopefully, vendor salesmen will soon begin to realize their responsibility to keep proposals reliable — even if it may mean risking the loss of sale.

© Copyright 1974 Alan Taylor. Reproduction for commercial purposes requires written permission. Limited numbers of copies for non-commercial purposes may be made provided they carry this copyright notice. The views expressed in this column do not necessarily reflect those of Computerworld.

The Taylor Report

By Alan Taylor, CDP



Find Your Place

- | | | |
|--|-----|----|
| (1) Do you have any DP knowledge in the installation? | Yes | No |
| (2) Do you have an understanding of the dangers of the hardware? | Yes | No |
| (3) Do you have an understanding of the dangers of the software? | Yes | No |
| (4) Do you have an understanding of the risks of automating the application? | Yes | No |

To Score: Count the "No" answers. If your score is 3 or 4, then the vendor should be very careful to provide really reliable data. If it is 1 or 2, you should be ready to take care of yourself on most areas, although not all. If it is *really* zero (and provided that you are not over-praising your own capabilities) then watch out that you don't get caught relying on anything that is not in the contract! You (or your employer) could be very sorry if you do.

EVER WONDER WHAT YOUR COMPUTER'S DOING... AND how well it's doing it?

Our 360/370 Utilization Reporting System HAS THE ANSWERS...

- **Performance Measurement**
- **Cost Distribution**
- **Software Evaluation**
- **Customer Billing**
- **Thruput Analysis**
- **Operations Monitor**

... and others - limited only by your imagination

Johnson Systems provides the most widely used and comprehensive computer utilization reporting system in the industry.

And there are a multitude of good reasons why.

We did not try to "second-guess" your installation's reporting requirements. The system features a flexible report generator which allows you to design your own utilization reports. We also provide a set of control cards defining a host of standard reports to complement your repertoire of custom-made reports.

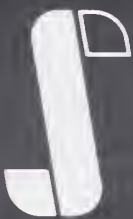
Our OS version accepts the SMF data base provided by MFT, MVT, VS1, and VS2 operating systems. In addition, the report generator can simultaneously accept our standard DOS data base.

A DOS-only version collects computer utilization data available via the job accounting option in the supervisor. The report generator subsequently processes this data according to user specifications. Accounting data available from GRASP and ASAP spooling systems can be processed too.

The system has been designed to maximize ease of operation. It's so simple — people use it.

We could go on and on about the advantages of our system and the things it can help you accomplish. Write or call us today, and we'll be pleased to send you more information about our product.

FAST BECOMING THE STANDARD



Johnson Systems, inc.

The Grant Building • Westgate Research Building • McLean, Va. 22101 • (703) 893-8700

Letters to the Editor

Independent Small Users A Generally Happy Lot

The latest batch of small systems user articles [CW, March 27] and the response by Evelyn Thomas [CW, April 3] touched upon a sore point. The impression *Computerworld* gives is that the non-IBM world is about as foreign as a Minsk-45.

While I can't agree with Thomas' accusation of CW's purported pro-IBM bias, I can empathize with her and the thousands of other non-IBM users. When it comes to reporting about their hardware and/or software, the bias they feel CW portrays is not really designed to be anything but factual reporting. After all, CW does its best and who really expects it to know everything about everybody?

So in its naivete CW concentrates on one vendor and reports mostly on the negative aspects of the non-IBM world. Ignorance is bliss and bad news is better than no news! Or so it is thought in the media.

Those of us who don't smoke Tareyton's but preferred to switch seem to be quite happy and glad we did. Just ask. We tend to ignore the ramblings of the demise of everybody except Big Brother to concentrate on making our non-IBM hardware and software even more cost-effective.

I firmly believe that up to the level of the 370/145, there is no application out there that cannot be run better and cheaper on somebody else's hardware — all the credentials and consultants who recommend IBM to the contrary.

Once you're hooked, of course, only the bravest break the inevitable systems-software-people bond. To most companies, traumatic is an understatement for conversion so they keep picking up the tab for every price increase with the delirious smile of a happy user. But then we all own a piece of the action and what's good for IBM must be good for the country.

Regarding Herb Grosch's comment to Thomas: How many testimonials would he like? Having seen a number of NCR Century conversions, I would venture to say that there is no site out there among the approximate 3,500 Century sites that upgraded and had any conversion problems.

A recompilation is optional if the user wants to take full advantage of new hardware power or a larger peripheral device. Here for once compatibility means just that.

We all tend to forget that those on the outside looking in must offer more for a lot less just to be taken for real. It's not that IBM can't do whatever anybody else does. It's just that IBM does what is best for IBM as long as so many folks are eager to foot the bill.

W. Fred Rump
Vice-President

Management Information Systems
E.B. Evans, Inc.
Philadelphia, Pa.

STANDARD DATA HAS SOMETHING FOR EVERY VM/370 INSTALLATION

SYMBUG™ Interactive COBOL Symbolic Debugging System

SYMBUG-F™ Interactive FORTRAN Symbolic Debugging System

ICS Integrated CMS Sort (OS compatible, stand alone, and invocable from COBOL, PL/I and Assembler)

VM/370 ISAM CMS Simulation of OS ISAM

D-SAVE File Compression (50% disk savings)

EXECMOD Conversion of EXEC files to Assembler code

GLAP Generalized language processor implementation for CMS

SLAP Specific language processors for CMS-featuring Assembler H, COBOL F, OS Fortran G, PL/I, RPG and LCP

The VM/370 software offerings from Standard Data Corporation make for more efficient use of computer resources; and that means significant savings in operating expenses. Let us show you how. For more information contact...

STANDARD DATA CORPORATION/ 1540 Broadway, New York, N.Y. / 212/586-3100

Software for VM/370
'Superior by Design'



Since 1959

Does Each Configuration Have a Natural Load?

By Don Leavitt
Of the CW Staff

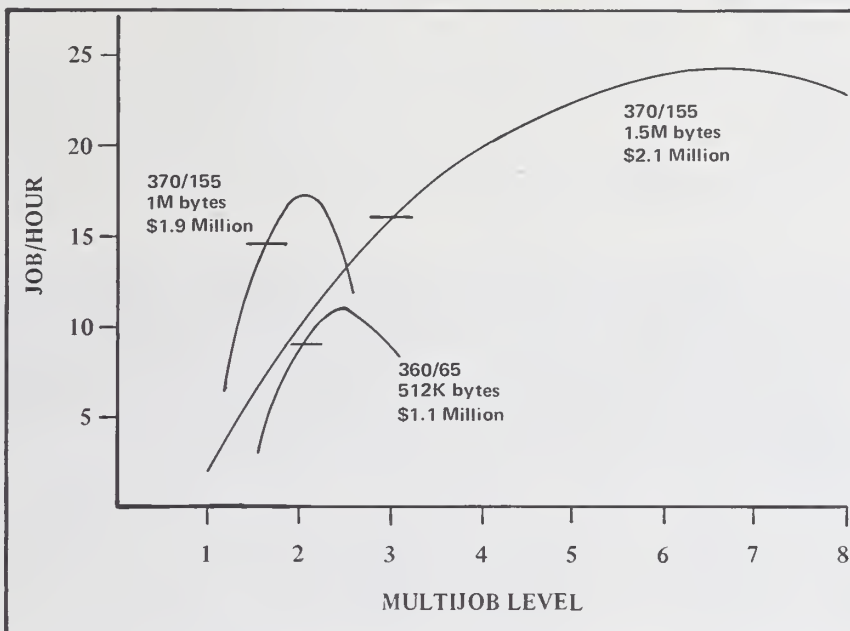
CLEVELAND — Ongoing research has shown that a simple computer accounting log can yield a great deal of information about the basic proficiency of the equipment, the software and the people manning the system, according to engineer Donald C. Harder of Computer EKG, a performance measurement firm.

Harder has developed a concept called the Computer Capacity Curve, based on data collected from a number of installations, each using the same configuration. The curve for each configuration plots the multijob level against job/hour to indicate throughput capacity for the particular hardware system.

The curves, Harder claims, are valid, being generated and confirmed through the use of regression analysis and calculation of standard deviations for the data collected.

And they show — clearly, in Harder's opinion — that there is a particular level of job/hour and multiprogramming that can be considered as normal effective use for a particular configuration, and that these apply regardless of what kinds of applications are on the particular configuration.

Identification of such a common job/hour-multiprogramming mix means



The crossbars on each of Harder's computer capacity curves mark the normal job level for the particular configuration.

that users of the charted configuration can now tell if they are operating as efficiently as they should be. Perhaps not surprisingly, Harder feels he has a list of suggestions that should aid "inefficient" sites in coming up to the

acceptable level.

The engineer noted that the plotting of capacity curves is not limited to IBM or any other particular brand of hardware. He has, for example, plotted curves for Hitac computers as well as

360s and 370s.

There is no special accounting data required, so it is not restricted to SMF, he went on. The "job" he is concerned with is "a unit of visible work coming from the computer system, ideally part of the accounting log. It must represent a unit of service or part of a bill submitted to a client."

The job may be an entry in the logging system for only a few seconds — because of some job control error — or it may be a job that lasts for hours. As long as the individual installation management is consistent in its definition of jobs, Harder claimed, the curve, and the implication of good or poor operation it represents in comparison with similar configurations, will be valid.

Though he has plotted curves for various IBM systems, and put them on the same display, Harder is reluctant to say they can be used to compare the systems for cost/effectiveness. There are too many unspecified but important factors to justify such comparisons, he said.

Harder is still seeking more data to confirm his current findings and apparently welcomes any well-thought-out reaction — pro or con — to his ideas.

Computer EKG and Harder are at 8921 Brecksville Road, 44141.

Users Gaining Options as More Sort Packages Appear

•Concurrent Jobs

OAK BROOK, Ill. — IBM 360/370 users can save time and both main memory and work space while sorting several files simultaneously, each under its own sort specifications, with the Pan-Sort software now available from Pansophic Systems, Inc.

Created by Computer Associates of Geneva, Switzerland, Pan-Sort comes in two forms, one that is completely IBM-compatible, and another that utilizes its own access method programming to allow immediate use of the next sorted record whenever a CALL is issued to a read or write statement.

Pan-Sort is able to perform simultaneous sorts for several application programs because the sort logic is written in reentrant code, the company said. The software itself is capable of merging up to nine files and sorting on up to 32 control fields.

In Beta tests during the past few months Pan-Sort saved 10% to 65% of sorting time and used 40% to 50% less work space and main memory than conventional sorts, Pansophic claimed.

Pan-Sort is available now for DOS users. The IBM-compatible version costs \$8,000 under perpetual license or \$2,000/yr under an annual contract. The Access Meth-

od option costs an additional \$3,000.

OS versions, expected to be ready in August, will cost \$10,000 or \$3,000/yr for the IBM-compatible base, and an additional \$5,000 for the Access Method option.

Pansophic is at 1301 W. 22nd St., 60521.

•Higher Capacity

SAN FRANCISCO — Cobol programmers working under OS/360-370 or OS/VS2 Release 1.6 can have 16 or 32 times the sort capacity normally available under IBM sorts, by using the Extended Cobol

Sort (ECS) package from Fireman's Fund Computer Services Department.

ECS supports IBM's ANS Cobol version (R1.2) and IBM's SM1 utility. The new package also works with Whitlow's Syncsort, a Fireman's Fund spokesman noted.

Under ECS, the Cobol SORT statement will operate normally until the capacity of the sort — determined by the amount of work space available and other factors — is exceeded. ECS then sorts the records read in and writes them to a dynamically obtained "stash file" tape.

ECS then reinvokes the sort and continues to accept records from the Cobol Input Procedure. If capacity is again exceeded, another "stash file" is created, and this may continue until 16 or 32 such files are in use.

Once all the input has been handled, all stash files are merged, with the result of the merge being fed to the Cobol output procedure.

Merging files in a Cobol program is simplified, the spokesman explained, by ECS's merge-simulation feature.

ECS is available under perpetual license for \$3,000 per installation, with multiple installation discounts allowed. Source code is included, the company said.

Fireman's Fund Computer Services Department is at 3333 California St., 94119.

'Pisces' Extends Edos, Backs Dynamic Partition Scheduling

RICHMOND, Va. — Extended DOS (Edos) has been even further extended by The Computer Software Co. (TCSC) with the release of the Partition Independent Scheduler-Class Execution Support (Pisces) feature. Pisces permits multiple batched partitions to be dynamically scheduled by the system.

This capability is used by Edos to provide maximum operational efficiency for those jobs capable of being executed in partitions other than the one to which they were originally directed, the company explained.

Pisces goes considerably farther than IBM's DOS which, even with multiprogramming, required the user to specify which partition should be used by a program, TCSC said. If a program were to

run in more than one partition, separate copies of the object code had to be created and maintained in the core image library.

Edos resolved some of those problems, TCSC noted, including relocatability of programs, automatic volume sensing, procedure library support and the disk space management facility. And the Extended Spooling Facility (ESF) allows jobs to be entered through a reader and directed to any one of a number of virtual reader queues for execution in a particular partition.

While the basic extended spooling required a scheduler system that knew where a particular job was to be executed, Pisces — an add-on to ESF — does

(Continued on Page 14)

VALUE COMPUTING
PUTS YOU IN CONTROL
OF YOUR
COMPUTER OPERATIONS

VS Scheduling is just one way.



Because it replaces confusion with confidence, speculation with specific answers for the IBM user who moved to VS, and now is not sure just what he might have gotten himself into.

Not that this new innovation in memory utilization is just a lot of VS, but sometimes the hoped-for benefits are replaced by job run-time stretchout, missed due-out times, system overhead degradation, thrashing. . . and second thoughts.

But think about VS Scheduling from Value Computing. It builds, maintains and works from a sound data base to optimize the job mix, and control the power of the VS system. Allowing users to set maximum paging limits for the entire system.

It puts you in charge of your computer operation. Which is the right place to be. Another "right place" is Value Computing.

That's our name. . . and our goal.

VALUE
COMPUTING INC.

496 Kings Highway North
Cherry Hill, NJ 08034 609-667-8770

VALUE COMPUTING INC.
496 Kings Highway North/Cherry Hill, NJ 08034

I'm interested in more details about
VS Scheduling:

- ☐ Please send additional information
☐ Please have a salesman call

Operating System _____

Name _____

Company _____

Title _____ Phone _____

Address _____

City _____ State _____ Zip _____

VIEWPOINT

'Distributed Analyst' Fits With Distributed Systems

By Frances Smyth

Special to Computerworld

Purchased packages free the analyst from programming time constraints, and well-considered software acquisitions are providing many installations with increased productivity. Of course, the *well-considered* part of the picture is the one that need be stressed, for poorly evaluated software can lead to its very own horror story.

Still, it was another type of horror story, the one concerned with the growing alienation of data processing personnel from user areas and upper management, that really spurred the current stress on personnel reform. The evolution of the "total analyst" [CW, May 22] seems a natural response, and there are some obvious benefits to be gained from combining the analysis and programming functions.

Firstly, there can be no translation problem such as occurs when a systems

analyst has to explain a program to a programmer via written or oral specifications. Since this was often a problem area, its elimination is definitely beneficial.

Secondly, the person in the programmer/analyst position as it is now evolving is more visible than a programmer. He deals with user departments and therefore commands more of the education resource. Programmers were all too often neglected because they did not interface with users or were "too busy" to get to school.

An analyst dealing with users cannot be too busy to learn because his ignorance would embarrass the data processing function. Better educated analysts are not necessarily more effective analysts immediately, but they should move in that direction or something is amiss with the way the training was performed and its results implemented. At the least, I'd be very unhappy with the education I had

purchased if I could not measure a beneficial result.

Thirdly, an analyst performing the entire systems and programming function for a user gains satisfaction from producing a complete project. That's really what all the job enrichment literature floating about has been trying to sell us and the results are believable. Certainly the programmer coding his umpteenth edit module can't have the same feeling about his work as the analyst who delivers the job which finally solves a user department's ever-climbing clerical error rate. Perhaps the word *perspective* sums this up best.

Fourthly, by having an analyst working closely with a user department we open a new career path to him. Because once an analyst develops expertise in an area, as a good one will do functioning in this manner, he may be transferred into that area in a non-data processing position. For a percentage of analysts, this could be a very positive advantage.

Thus, I could see us having distributed analysts in much the way we talk of distributed computing systems. And this is only possible if the analyst, like the minicomputer, is a self-contained facility for a majority of the work required.

Having made a case, I hope, for a combined programming and systems analysis function, let me detail what I would see as a possible job description for this position.

Job Title: Data Processing Analyst

Duties:

- Assumes total responsibility for specific project areas, interfacing with user department personnel.
- Designs, codes, tests, documents and installs systems and subsystems as needed to meet user requirements.
- Suggests new areas for computerization as a result of familiarity with user area processing.
- Gains in-depth knowledge of user area and its interface with other company areas.
- Develops himself in the areas of general business skills and data processing knowledge.

Requirements:

- General business background, preferably with some training or exposure to accounting principles.
- Data processing experience and/or training in the areas of systems analysis and one or more interactive languages.
- Exposure to simulation and modeling techniques at a minimum.
- Excellent oral and written communication skills.

The level of education and experience will be reflected in the analyst level assigned. No specific degree requirement is stated as I am not convinced of its necessity. The specific tasks would vary by installation environment and user area.

I am convinced this approach will become more popular as the success of its application becomes known. Getting data processing integrated into user areas may eventually dissolve the separate data processing structure. Given the integral nature of computer processing to all areas of a firm, this seems a very reasonable trend.

Frances Smyth is a senior systems programmer at Metropolitan Life Insurance Co. and an adjunct assistant professor of management at New York University.

Whatever happened to the checkless society?

To paraphrase Mark Twain, those reports on the imminent demise of cash and checks are greatly exaggerated. And that's one of the subjects you'll find in our June 26th Supplement, **Computers in Banking and Finance**.

Edited by Don Leavitt, this *Computerworld* special report will cover several important topics, including:

- Banking and the consumer.
- The electronic funds transfer system - where it is and where it might be going.
- Banks and minicomputers.
- The acceptance and future of OCR.
- MIS - is it here now?

If you're involved in this field, our June 26th Supplement will be very interesting reading - and if you're marketing to this industry, your ad should be there. Supplement close is June 7th.

For more information, just contact your nearest *Computerworld* salesman. Or call Judy Milford at (617) 965-5800.



Boston
Bob Ziegel
Mike Burman
(617) 965-5800

New York
Don Fagan
Frank Gallo
(201) 461-2575

Los Angeles
Bob Byrne
(213) 477-4208

San Francisco
Bill Healey
(415) 362-8547

'Pisces' Extends Edos

(Continued from Page 13)

not. It performs the scheduling function based on a user specified job classification, and the classification of partitions as specified by the user.

Pisces allows any job to be entered in a job stream with a job class designation, which immediately signals that the job can be run in more than one partition: it is relocatable and the resources required by it are available to more than one partition. Jobs without the class designation are assumed to be executable only in the partition to which they have been directed.

Pisces is now available for \$40/mo, in addition to the cost of the basic Edos and the ESF facility, both of which are required to use Pisces; Edos and ESF for a total of \$500/mo rental or \$425/mo on an annual lease.

TCSC is at 11 N. Sixth St., 23219.

PRODUCT AND MARKET
PLANNING

—

EDP BUSINESS
STRATEGY

AUERBACH
ASSOCIATES, INC.

PHILADELPHIA • NEW YORK
WASHINGTON • LONDON

(215) 491-8200

The Graham Vow.

The Graham Vow expresses Graham Magnetics' pledge at a time when much of the computer tape industry strives for lower production cost through shortcut processing and testing.

- Graham has maintained and will enhance its program for

increased excellence of product and high standards of Quality Assurance.

- Graham will take *no* shortcuts in manufacturing and testing of tape.
- Graham will *not* relax the stringent inspections and 100%

certification which every reel of tape must pass before shipment.

- Graham will *not* delude you by compromising quality. On the contrary, Graham will enact even more exacting standards with the continuing development of new precision methods and techniques.



**GRAHAM
MAGNETICS**

Graham, Texas 76048

Comten 3670 Tied to 360/370

Programmable Front End Handles TP on Dual CPUs

By Patrick Ward
Of the CW Staff

COLLEGE STATION, Texas — Last year Texas A&M University decided to add a second central CPU to its network, which serves both the school's own students, researchers and administrators and several other universities and public agencies across the state.

Texas A&M had been using a Memorex 1270 communications controller with a 512K IBM 360/65; however the 360's workload "got to the point where we needed some additional capacity," said Jack Thompson, manager of the computer systems group.

The second CPU, an IBM 370/45 with 768K, would have required its own 1270, Thompson observed, so his staff looked at several other possibilities and finally chose to replace the existing 1270 with a Comten 3670 front end, which has dual channel interfaces and could serve both CPUs at once.

The Comten unit, unlike the hardwired Memorex 1270 that preceded it, is a programmable device, but Thompson said the school has not done any customized programming with it yet. It expects to start in about a year, perhaps with a "one to many" capability allowing the school to easily broadcast messages to all its users.

Savings Evident

Texas A&M's Memorex 1270 configuration had cost \$2,500/mo, Thompson said, and he estimated that two 1270s serving the two computers and sharing the incoming lines would have cost about \$4,000/mo. The Comten 3670 does the job for \$2,900/mo, he said.

But two IBM 3705s necessary for the job "would not have cost tremendously more than what we wound up paying for the Comten unit," Thompson related, and those systems would have provided less flexibility.

Texas A&M supports a variety of teleprocessing software, with APL on the 360 operating under OS/MVT, and CMS (Conversational Monitor System) on the 370 using VM/370.

With the 3705 front ends, Thompson said, "we would have had to define one group of terminals as being on one box, and another group on the other box."

Then if a user wanted to switch to the alternate system, operators at the central site would have had to pull plugs, or at least use a manual switching device, Thompson said.

But the Comten unit's software handles either terminal- or central site-initiated switching, he said.

The switching capability is particularly valuable on time-sharing terminals, he mentioned, as it allows a user to sit down at a terminal, dial a single number that

reaches the central computer installation, and key in which software system he wants to work with.

Since the university supports six different systems for start/stop users, it would otherwise have to support six sets of phone numbers for them, Thompson explained.

Additionally, the 3670, like the Memorex 1270, provides automatic bit/sec rate detection so users with teletypewriter terminals, IBM 2741-type equipment or others with speeds from 100 to 1,200 bit/sec can call into the DP center on the same phone line.

"If we did it the other way," Thompson

said, "we would have had to provide different lines for different speeds and different type terminals" — or perhaps 12 lines for the six systems.

Texas A&M's terminal mix includes 22

User Casebook

Harris Communications Cope 1030s, one IBM 2740, two IBM communication Magnetic Card Selectric Typewriters, a Texas Instrument Silent 700 and a Tektronix 4013 Ascii-compatible APL terminal.

Additionally, there are eight RJE ter-

minals with transmission rates ranging from 2,000- to 9,600 bit/sec.

On campus there is one IBM 2770 transmitting at 2,000 bit/sec, an IBM 3780 transmitting at 4,800 bit/sec and a Uni-tech UT1 transmitting at 9,600 bit/sec.

There are also five UTIs in Austin, an IBM 3780 at Prairie View A&M College, a Remcon 2780-type terminal at Carleton College in Stephenville and an IBM 1130 at the Red River Arsenal in Texarkana; all these terminals transmit at 4,800 bit/sec.

Thompson said his installation hasn't experienced any downtime with the Comten unit since accepting it and going fully on-line last February.

Service Scheduled for July

Westar Slashes 50% Off Land-Based Rates

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. — The promised savings of satellite services came a step closer to data users when Western Union filed rates with the FCC for its Westar service scheduled to become operational on July 1.

The rates for private-line two-way channels promise to save users as much as 50% over existing terrestrial services, a WU spokesman said. Using the filed Westar rates, if approved by the FCC, a user could get a voice-grade channel be-

tween New York and Los Angeles for \$1,000/mo compared with \$2,100 for a similar land-based facility.

The initial service will include a communications link to downtown metropolitan areas in New York, Atlanta, Chicago, Dallas, Los Angeles, San Francisco and Washington, D.C. The proposed Westar rates would bring the user's signal into the downtown area to the Western Union central office but would not include any local loop facilities required.

It is estimated the satellite rates will be cheaper than current land-based channels

at distances up to 200 miles from the Westar metropolitan areas, a spokesman said. This is subject to individual requirements but users would have to do a cost analysis on whether to use land or satellite services depending on the distance from a Westar city.

The service rates would cover a two-way channel which is quoted as having "less than a 270 msec delay" on a one-way transmission. In some cases, such as on polled nets where a high volume of automatic dialing is done, it may be necessary for users to install a buffer to overcome the added delay caused by the transmission of a signal up to, and down from, the satellite.

The Westar service will allow users to contract for one, 12, 60 or 300 channels depending on requirements. Each WU satellite has a capacity of 1,200 one-way voice circuits or 50M bit/sec of data traffic. The first satellite is now in service and is being checked out with earth stations located near the metropolitan service areas. A second backup satellite is scheduled for launch in June and service will begin shortly thereafter.

Two-way service between New York and Chicago will be \$500/mo on Westar compared with \$600/mo on current land facilities. Western Union plans a liberal interconnection policy for its satellite service and will allow direct interconnection with customer-provided terrestrial links or with facilities of other common carriers. Direct access to a customer-owned earth station is also possible.

Monthly rates were filed for 19 service routes between the major cities in the service. Discounts will be available for multigroup channels. The Westar service will include a digital data offering in the future which will include some capability to handle the propagation delay for the user, a WU spokesman said.

NCR Has On-Line Bank Terminals

DAYTON, Ohio — NCR has introduced two bank terminals, the NCR 279, which the company calls "the smallest on-line universal financial terminal in the industry," and the programmable NCR 770 self-service terminal, a modular unit that can expand from a cash dispenser to a self-service teller terminal.

The 279 can operate on-line, off-line and in data collection or manual reentry modes, NCR stated.

The terminal allows tellers to process account inquiries, checking transactions, savings transactions, loan payments and utility bills without leaving the window to examine balances, according to the firm.

The 279 is built in modular parts including printed circuit boards, display unit, keyboard printer and power supply, so field engineers can simply change a module to service the terminal, NCR said.

The 279 is compatible with the NCR 270, 275 and 770 terminals in its on-line mode. All these terminals can be mixed or matched at will through a digital concentrator.

The 279 costs \$2,600 for the on-line

model, \$2,375 for the off-line unit. First deliveries will be in the fourth quarter of this year.

Independent Terminal

The NCR 770 self-service banking terminal is a programmable device that can operate independently and produce journal tape or optional tape cassette for later processing.

The system allows bank customers to deposit or withdraw funds in savings, checking and other accounts; withdraw cash; pay mortgages, installment loans or other preauthorized accounts such as utility bills or doctor and dentist bills; and transfer money among accounts.

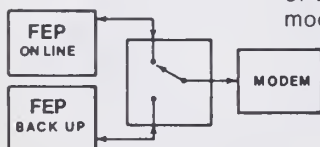
The system is a self-contained unit including the terminal controller, cash dispenser and depository, all within a safe.

Its modular design permits its use as a cash dispenser for about \$18,000, and it can then be upgraded to become an on-line self-service terminal priced at about \$33,000, NCR stated.

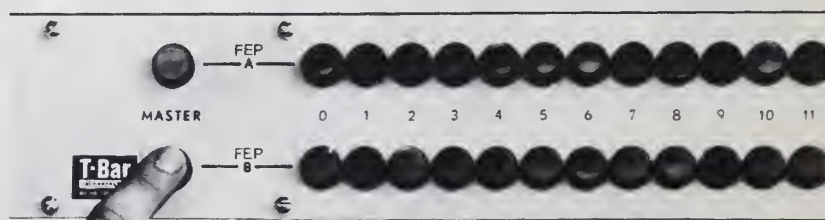
The 770 is undergoing a test operation at NCR's Employees Credit Union and first customer deliveries are set for this fall.

Switch RS232 lines between FEPs instantly...

T-BAR® Series 5100 Remote Control EIA (RS232) FALL BACK SWITCHES are new, fast and reliable, allowing operators to switch modems or terminals singly or simultaneously-in-groups between two or more FEPs... or between computer ports from on-line to stand-by modems... or other terminals.



Available in 8 or 16 channel standard 19" rack units.
As low as \$175.00 per channel.



T-Bar Universal Fall Back Switches have been used successfully to switch various Front End Processors, including IBM 3705, IBM 270X, UNIVAC 1108, Burroughs 5000, Memorex 1270, DEC PDP-11/45.

Regional Sales Offices: Boston (617) 890-3085 • Chicago (312) 671-5182 • Columbus (614) 262-0915 • Canada (613) 737-5941 • Washington, D.C. (703) 528-7773
New York (203) 762-8351 • Philadelphia (215) 363-1544 • Los Angeles (213) 879-9045 • San Francisco (415) 569-6341 • Seattle (206) 624-9020

141 Danbury Road
Wilton, CT 06897
Telephone: 203/762-8351

Data
Systems
DIVISION
T-Bar
INCORPORATED
SWITCHING TECHNOLOGY

If you'd like to avoid data communications hangups, then communicate with us now!

If you're now involved with data communications (or will be soon), this unique seminar will teach you what you need to know about this complicated area.

This is the seminar that wraps it all up for data communications users. It's called *Data Communications — The Executive Imperative*, and it covers both fundamentals and applications-oriented subjects ranging from transmission theory to terminal selection techniques. It gives you what you need to know to plan effective communications systems in two busy days. And that's saying quite a lot. Because data communications is a complicated area with many problems for the user. Proper planning is a must. And this seminar tells you how to go about it.

Some of the things you'll learn:

- Basic terminology of the field.
- Tariffs and cost-savings.
- Effect of transmission problems on a network.
- The modem — how it works and what it does.
- Terminals and their performance.
- Multiplexing and data concentration.
- Line-control software.
- Network organization and design.
- How to upgrade to a bigger system.

Data Communications,
The Executive Imperative

Course materials and outline prepared
by the ICC Institute.



SPONSORED BY



COMPUTERWORLD

Free reference materials
and continuing updates

As a participant in the Data Communications Seminar, you'll receive a valuable set of reference materials prepared by the ICC Institute. These materials include a comprehensive 2-volume looseleaf outline of all course materials, a copy of "Data Modem Selection and Evaluation Guide" by Vess V. Vilips, a "Data Communications and Teleprocessing Dictionary" and a line-cost calculator.

And that's just the beginning. You'll also receive free update materials for a full year! This is more than just a seminar. It's a continuing reference service as well.

Seminar Leader is Dr. Dixon Doll,
a highly respected
teleprocessing consultant

Dr. Dixon Doll leads the expert faculty at this seminar. He has his Ph.D. in Systems Engineering from the University of Michigan and many years of experience in this field as a consultant and educator. He has performed work-

study with communications techniques at M.I.T., taught graduate-level computer systems design, and has served as professional consultant to such firms as IBM, Raytheon, ICC and MCI. Dr. Doll is in charge of our faculty of experts, and takes an active part in the entire seminar.

You should attend this seminar, if . . .

- You are currently involved in data communications on a management or operational level and wish to expand your knowledge of the field.
- Your company will be going into this field in the near future.

Charges and Enrollment

The total cost for this two-day seminar is \$350, including workbook, reference materials, year-long update service, luncheons and continental breakfasts. This cost does not include hotel rooms, if necessary.

To enroll, look over the schedule below, fill out the coupon and send it in. Remember, enrollment must be limited, so don't wait until it's too late!

DATA COMMUNICATIONS REGISTRATION FORM

To: Walter Boyd, Executive Vice President, Computerworld, Inc.
797 Washington Street, Newton, Massachusetts 02160

- ☐ Reserve _____ place(s) at your Data Communications Seminar for the city and date(s) checked and send a copy of your descriptive brochure.
- ☐ Check enclosed (\$350 per person)
- ☐ Purchase Order enclosed
- | | | |
|--|------------|------------------------------|
| <input type="checkbox"/> New York | June 10-11 | Americana |
| <input type="checkbox"/> San Francisco | June 17-18 | St. Francis |
| <input type="checkbox"/> Orlando | July 1-2 | Royal Inn (Lake Buena Vista) |

Name _____

Title _____ Telephone _____

Company _____

Address _____

City _____ State _____ Zip _____

Time is short. Write or call today!

If you'd like to make sure we hold your space, just call in your reservation before sending the registration form. Call Rosemary Jones (collect) at (617) 965-5800.

CCI User Group Set

TORRANCE, Calif. — Computer Communications, Inc. has announced the establishment of a CCI Users Group among its users of CC-70 and CCI-7000 communications processing systems. Twelve major users of CCI systems were represented at the charter meeting of the group which was held in Houston last month.

The major objective of the new organization is to foster communications among CCI system users for the exchange of information and promotion of cooperative efforts in areas of common interest.

John Fleming, manager of on-line services for the Canada Systems Group, was elected president of the new organization.

The next meeting of the CCI Users Group is scheduled for Sept. 9-10 in Toronto. Users interested in the group should contact Fleming at Canada Systems Group, 2599 Steakman Drive, Sheridan Park, Ontario, Canada.

For Total Testing

Transmission Channel Impairments Simulated

RICHMOND HILL, N.Y. — SEG Electronics, subsidiary of Comstron Corp., has announced a system for total simulation of data communications channels.

The Simuline system is a flexible selection of modular instruments designed to precisely simulate phase jitter, dropout, delay-echo and such other characteristics normally found in data transmissions. Plug-in modules are available to produce broadband noise, impulse noise and harmonic distortion.

The Simuline system consists of four main modules and a series of precision plug-ins which permit the user to mix and match those units required to meet his specific needs, at minimal cost, the firm said. As required, additional units may be added to increase the system's capability.

The SEG Model FA-1564A mainframe provides phase jitter and impairment simulation allowing an evaluation of the effects of telephone channel impairments on communications equipment.

The SEG Model FA-1755A simulates the echo and delay characteristics and impairments found on Bell, DCS and CCITT schedule leased lines. It provides simulated echo impairments over a wide range of delays, amplitudes and return

losses.

Simuline components are priced starting from \$249 and delivery is 30 days. Applications engineering assistance is available free of charge, from SEG, 120-30 Jamaica Ave., 11418.

Infoton Unit Microprogrammable

BURLINGTON, Mass. — Infoton has introduced a microprogrammable display terminal called the Vistar/XL. The device is a stand-alone microprogrammable display terminal with a package of features and options designed to accommodate a wide range of applications, the firm said.

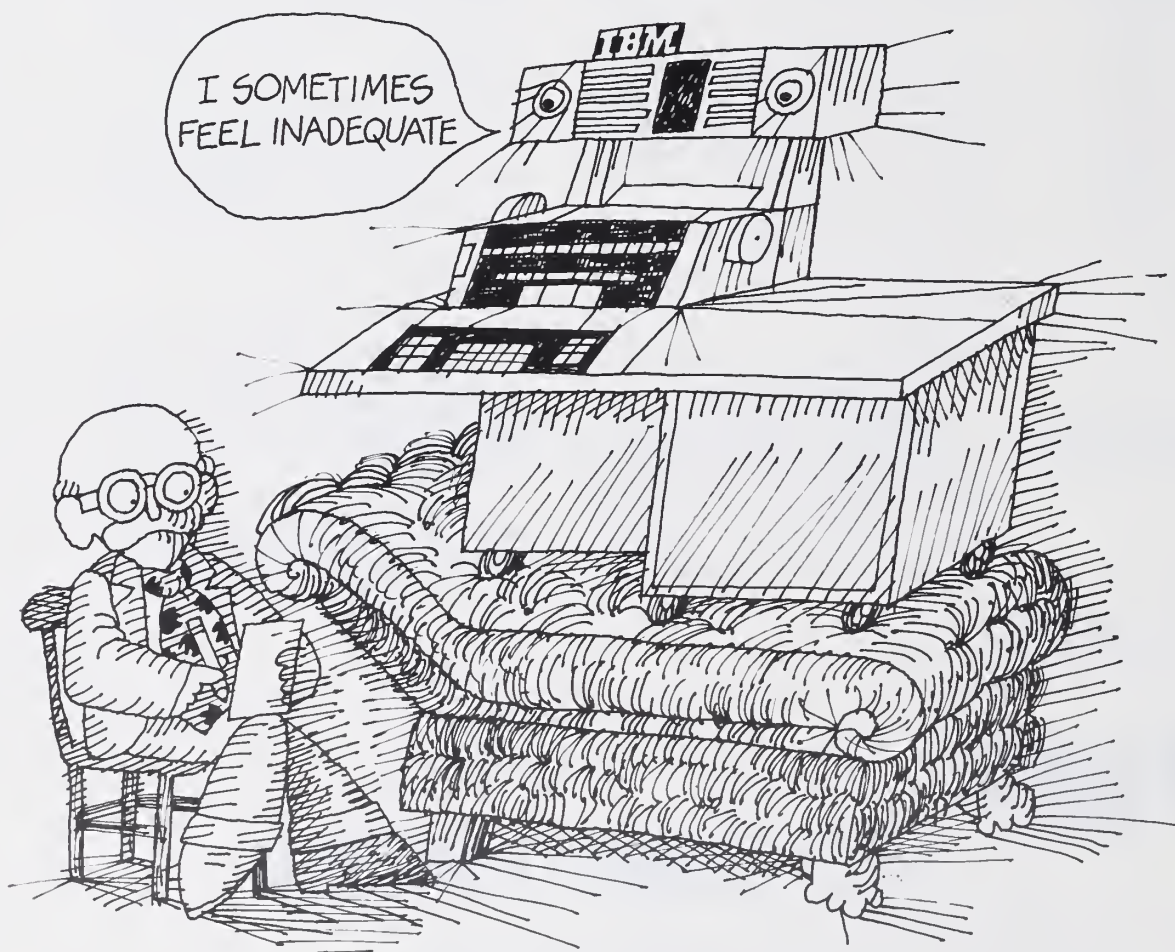
By utilizing its built-in microprocessor and read-only memory the Vistar/XL provides flexibility to the user, the firm added.

The new terminal features microprogramming, remote keyboard, addressable

cursor and protected data capability. Interfaces include multipurpose, switch-selectable, multispeed interface, and both RS 232 and current loop.

Options include 12 programmable function keys, full line and character editing, three full pages of memory, 15-in. high resolution TV monitor, and several peripheral interfaces.

The Vistar/XL sells for less than \$3,000. First deliveries are scheduled for the last quarter of 1974. The firm is at Second Ave.



Computer Hardware Inc. has a painless cure for overworked 1130 systems

Add a disc storage system with 20 times the capacity and more than 12 times the speed of the integral disc drive in your 1130. Our CHI-1114 disc storage system has a capacity of 10.24M words and can be expanded to 20.48M words by adding a second disc drive. No software modifications are required to install a Computer Hardware Inc. disc storage system.

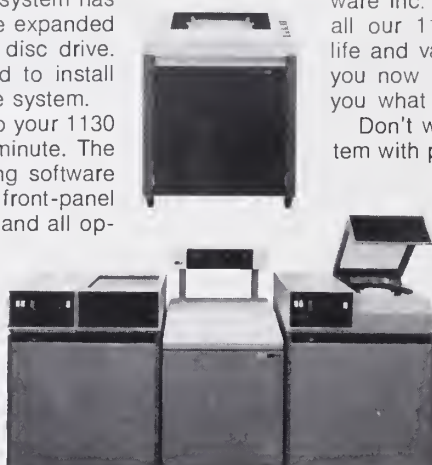
Add a line printer that plugs right into your 1130 and turns out a steady 600 lines per minute. The CHI-1103 line printer uses your existing software without modification and provides easy, front-panel access for paper and ribbon changing and all operator controls.

Add core at half of IBM's cost. Add a big chunk of core. As much as 65K, by plugging right into the CPU with the option of accelerating your machine to 2.2 μ sec. And when you add

CHI core, your 1130 DM2 programs need no modification.

There's a lot more add-on capability at Computer Hardware Inc. Write today for complete information on all our 1130-compatible products to extend the life and value of your original CPU investment. (If you now have an 1800 system, say so—we'll tell you what we have in that department.)

Don't wait... cure your overworked 1130 system with peripherals from Computer Hardware Inc.



CHI
COMPUTER
HARDWARE INC.

CHI Field Offices: New York, NY (212) 759-8885; Oak Brook, IL (312) 986-0141; Fullerton, CA (714) 871-2030; Tacoma, WA (206) 473-0505; Houston, TX (713) 665-7741; Anchorage, AK (907) 272-7074

Add-on peripherals from Computer Hardware Inc.

P.O. Box 4496, Sacramento, California 95825, (916) 929-8731

NCR Checkout System Handles UPC Bar Code

DALLAS — NCR has introduced an automatic UPC scanning checkout system for the food store industry with initial customer deliveries scheduled for mid-1975.

The announcement was made at the 37th annual convention of the Super Market Institute here, at which NCR demonstrated the system.

The scanning unit, which is housed in the checkout stand, is priced at \$4,995. It operates in conjunction with NCR 255 electronic checkout terminals and an NCR 726 in-store computer. A typical automated checkout system for an eight-lane supermarket will cost approximately \$110,000.

The first of the new scanning systems will be field-tested at a Marsh supermarket in Troy, Ohio, next month. This will be followed by a second installation shortly after the first of the year in a New England market, NCR said.

The NCR 255 scanning system automatically reads the UPC bar code printed on cans, boxes or packages as they are passed over a slot in the checkout counter. It is an optical reflective system which utilizes a laser light source.

NCR also announced at the SM1 convention expanded capabilities for the NCR 255 system so that the in-store processor can control up to 32 separate devices.

Intelligent Terminal Displays APL Characters

PLAINVIEW, N.Y. — An intelligent video display terminal for APL use has been introduced by Ontel Corp.

Known as the Ontel Series A4000, the unit combines the standard intelligent terminal with a specially designed APL keyboard and character set.

The Ontel terminal displays both APL and standard Ascii character sets. A 4K microprocessor in the Ontel A4000 provides on-line and off-line operating capability.

Advantages claimed for the Ontel A4000 include a true APL overstrike capability, a foreground-background switch for selective display of an overstruck APL symbol and full character editing within the APL definition or execution mode.

A single APL Out key permits the user to generate the APL special function with one keystroke.

A graphics option for the A4000 terminal employs a 12,800 point addressable matrix.

Priced at \$4,360 each with education and volume discounts available, delivery is scheduled within 45 days. The firm is at 3 Fairchild Court, 11803.

Bits & Pieces

Tapes Become Read-Only With 18-Cent Plastic Ring

TEQUESTA, Fla. — Users who wish to limit magnetic tapes to a read-only format can install a Filegard Systems plastic data protection ring directly on the reel.

The Filegard ring physically blocks insertion of the file protect/write ring without activating the write enable switch. This converts the magnetic tape to read-only storage, according to the company.

Some of the benefits of using this ring system, the firm said, are:

- A positive safety margin against accidental erasure/alteration of data.
- A deterrent to deliberate alteration of tape data.
- A reduced need to keep duplicate tapes.
- A higher degree of confidence that the tapes will not be used on the wrong job.

Filegard rings cost about 18.5 cents each in quantities of 1,000 and require an installation and removal tool set priced at \$15. Filegard Systems can be reached through P.O. Box 3114, 33458.

Varian Drops Prices 33% On Semiconductor Memories

IRVINE, Calif. — Varian has dropped the prices of its semiconductor memories and V-70 series memory management system (memory map) by 33% and 30% respectively.

The company's 8K 16-bit dual-port semiconductor memory with 330 nsec cycle time is now priced at \$4,000, reduced from \$6,000.

The memory map, used when expanding memory beyond 32K words, is \$3,500 instead of \$5,000.

These lower prices are the result of decreasing costs of semiconductors and higher manufacturing volume economics, according to the firm.

Varian is at 2722 Michelson Drive, 92664.

Tapes Designed for DEC Mini

BELTSVILLE, Md. — Computer Operations, Inc. is offering a plug-to-plug compatible tape unit for Dectape TC11s and TU56s on the DEC PDP-11 mini. The CO-500D-11 Linc tape is priced at \$6,700 for a two-drive unit and has an option switch that can double the storage density of data.

The Linc drives require 5-1/4 in. of rack space per drive. The firm is at 10774 Tucker St., 20705.

Diskette Priced at \$7.25/10

PORTSMOUTH, N.H. — Morley Co. has priced its IBM 3740-compatible diskette at \$7.25 each in lots of 10. The firm is located at 909 Islington St., 03801.

NMA Show Unwraps COM Products

By Vic Farmer
Of the CW Staff

BOSTON — New products were one of the main highlights at the National Microfilm Association exposition held here recently, with computer output microfilm (COM) equipment in the lead.

LogE/Robertson introduced a printer that takes 16mm or 35mm roll microfilm and creates electrostatic copies at 20/min.: 9 in. by 12 in. electrostatic plates for an offset duplicator at 11/min.; and Verilith and 3M plates for an offset duplicator at three/min.

The \$25,000 unit can accommodate computer-generated film in either cine or comic mode and is daylight operable. The company is at 250 Wille Road, Des Plaines, Ill. 60018.

Gould Data Systems announced its Beta COM 800L machine with the ability to construct "virtually any type of character for scientific and graphic arts applications" from computer-generated data. The 800L's vector processor has direct access to the memory of the system's front-end minicomputer and provides an average output of 12,000 vector/min with an addressability of 16K by 16K dots.

The unit's film reader assembly includes a 35mm camera with automatic controls for forms intensity, camera movement and half-size reductions of images on a

CRT display.

The dual (read/write) tape cassette input terminal added to the system accepts writing and inputting program patches and job setup parameters; and the operator can obtain hard copy printouts of frame, fiche, tape and file counts as well as systems conditions.

Software available includes print tape processors; programs to convert output files into charts, drawings and graphics; and simulators for other COM devices or pen plotters. The 800L is priced at \$130,000 from the firm at 20 Ossipee Road, Newton, Mass. 02164.

Random-Access Card Retrieval

GAF Corp. demonstrated its random-access card storage and retrieval unit that will allow an operator to retrieve aperture card-mounted microfilm in "seconds." The cards are contained in a series of retrievers each holding 4,000 cards.

In addition, any semirigid tab size document can be used such as paper tab cards, microfilm jackets, microfiche and magnetically faced cards.

The GAF 4000 system consists of three basic assemblies: a controller for retrieving cards, an encoder and a retriever file for holding cards. A three-part system with a 4,000-card capacity costs \$11,800 from the firm at 140 W. 51st St., New

York, N.Y. 10020.

Of the two microfiche readers GAF announced, the GAF 7700 MR accommodates 24:1, 32:1 and 42:1 COM to project 11 in. by 14 in. pages at three-quarter size on an 11 in. by 8-1/2 in. screen. The 7700 MR costs \$179.50.

The 7800 MR, priced at \$259.95, projects a full size printout page on a 15-1/2 in. by 11-1/2 in. screen.

Bell & Howell showed its Syncro-Search retrieval system that uses records stored in microfilm cassettes, rolls or cartridges. After a file search, the image can be printed or optional half-size prints can be obtained. The Syncro-Search is priced at \$5,495 from the firm at 6800 McCormick Road, Chicago, Ill. 60645.

Kodak also had a new series of readers, the Ektalite 200, which permits full text viewing of 11 in. by 14 in. computer pages on a 9-1/4 in. by 11-3/8 in. screen.

The Ektalite 200 readers are suitable for microfiche, 16mm and 35mm film and aperture cards, and are priced at \$140 from the firm at 343 State St., Rochester, N.Y. 14650.

In addition, Kodak announced a magnetic tape unit for its KOM-80 and KOM-90 COM units. The phase-encoded, 1,600 bit/in. drive operates at 37.5 in./sec and is priced at \$1,600. The data transfer rate is about 60 kchar./sec.

NCR Releases 8 Peripherals for Century Series

DAYTON, Ohio — NCR has added eight peripherals for the Century series of computers. The peripherals include disk and tape drives, card processing equipment and high-speed impact printers.

The disk system uses a controller with a cassette handler and one or more units of a new NCR 658 disk. This single-spindle disk unit has a rated capacity of over 90M bytes and an average access time of 38.3 msec. The controller can handle up to 16 disk units, providing 1.6G bytes of storage.

The 658 disk capacity is 40% greater than that of the 657, previously NCR's largest disk unit; and the 658 is intended for use in larger Century configurations, the firm noted.

The 658 system controller is priced at \$42,000 and rents for \$1,000/mo. The 658 disk drive sells for \$25,000 and rents for \$550 monthly. Customer deliveries will start in the second quarter of 1975.

Tape Subsystems

The magnetic tape subsystems are low- and medium-performance units for smaller Century processors and two high-performance units for larger systems. All use a single-capstan drive and have tape-buffering chambers.

The NCR 634-100 tape drive offers phase encoding (1,600 bit/in.), with a tape speed of 25 in./sec, resulting in a transfer rate of 40 kbyte/sec. Dual-mode

capability is optional with both phase and 9-track NRZI industry-standard encoding available on one drive. The NRZI transfer rate is 20 kbyte/sec.

The second series of 634-200 subsystems offers performance double that of the 634-100. These systems operate at 50 in./sec and have transfer rates of 80 kbyte/sec in phase encoding, and 40 kbyte/sec in NRZI encoding on the units with dual mode.

Two other magnetic tape drives, the NCR 635s, provide higher performance evaluation, the firm said. One of these units has a 100 in./sec tape speed and 1,600/800 bit/in. encoding, with corresponding transfer rates of 160/80 kbyte/sec respectively.

A second model offers 200 in./sec speed and 1,600/800 bit/in. encoding with corresponding transfer rates of 320/160 kbyte/sec. These units use a free-standing controller, to which up to eight tape drives can be connected.

The 635s also offer auto-threading, automatic latching of the supply reel and a power access window.

Prices for the 634 tape handlers begin at \$25,830 with monthly rentals starting at \$615. The prices for the 635 units begin at \$45,525 or \$1,050/mo.

Card Units

The NCR 684 card read/punch is offered in two models, a punch-only unit at

\$22,860 or \$540/mo, and a read/punch unit at \$25,830 or \$615/mo. These free-standing, fully buffered units have a punch speed of 100- to 460 card/min. The unit reads 80-column cards at 500/min.

The 646 and 647 fully buffered printers employ a horizontal moving train with changeable train arrays and an image memory to contain the characters in each train.

The 646 printer normally will operate at 1,200 line/min with a 48-character set. Bursts of up to 2,500 line/min are possible on special train configurations customized to a user's unique requirements.

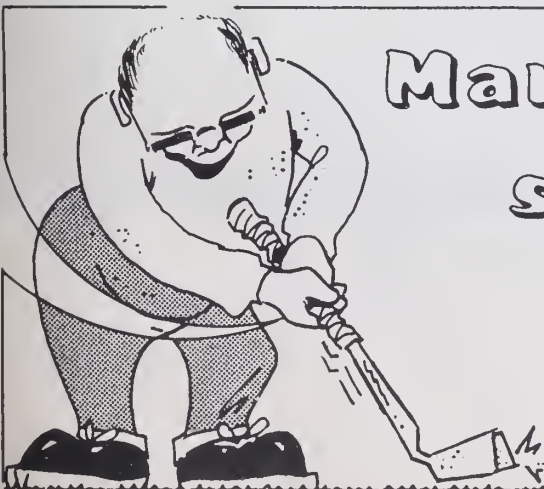
The 647 unit will normally operate at 2,000 line/min and in bursts of up to 3,500 line/min with a special tailored train.

The printer and its controller are housed in the same cabinet which has a control panel both front and back for operator convenience, NCR noted. Each of the printers offers the option of printing either 6- or 8 line/in.

Each prints 10 char./in. and can make an original and five copies.

The 1,200 line/min 646 printer will sell for \$55,600 or rent for \$1,325/mo. The 2,000 line/min NCR 647 printer is priced at \$71,400 or rents for \$1,700/mo.

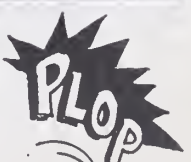
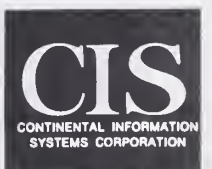
Deliveries of the tape subsystems, card equipment and printers will begin in the third quarter of this year.



Many handicap chairmen still use the 360!

(CIS HAS GOT A FEW LEFT)

CALL COLLECT: EUGENE CHAPPELL
315-474-5776



CONTINENTAL INFORMATION SYSTEMS, MIDTOWN PLAZA, SYRACUSE, N.Y. 13210

Eight reasons why Four-Phase's new 8 station key-to-disc system is your best buy for \$120/month per station.



1.

Large 12-inch video terminals display variable length records up to 192 characters with 7x9 dot matrix font for optimum legibility.

2.

Powerful DATA IV/70 software, field proven in 5 million hours of operator use, stops errors at the point of entry.

3.

Nonrecording prompts and display-only check fields for conversational fill-in-the-blanks entry—plus continuous display of batch status and any of 65 operator messages.

4.

Movable keypunch or typewriter-style keyboards with *Illegible Field* and *Validation Override* keys for operator convenience.

Is your present data entry system keeping up with your needs?

Now the power of Four-Phase's sophisticated key-to-disc systems is available in an economical package for the 8-station user. The new Model 7008 Data Entry System is ideal both for keypunch users seeking a low cost introduction to shared processor data entry and for present key-to-disc users who want more power than they are now getting from their current systems.

Model 7008 comes with DATA IV/70, the field proven software package that catches errors other systems never know are there. DATA IV/70 lets you enter, verify, search, update, insert, reformat, and transfer records with ease.

A total data entry solution, Model 7008 combines eight 288-character video terminals with a 24K byte processor, 2.5M byte disc drive, and 800 bpi tape drive. All for \$120/month per station on a 1-year lease including software, installation, maintenance, operator desks, cables, and customer education services. A terminal-oriented self-teaching instruction course is also provided for individualized operator training.

For hard copy output of screen images and data files, a 30 cps printer is available for \$120/month.

Best of all, Model 7008 is backed nationwide by Four-Phase Systems' marketing, field engineering, and systems software personnel, all committed to total customer support.

We have installed over 10,000 terminals in leading business, financial, and government organizations.

To discover how efficient data entry can be, call our local Branch Office for a personal demonstration today.

Atlanta	(404) 351-0070	Kansas City	(816) 561-8989
Baltimore	(301) 437-2552	Los Angeles	(213) 640-1438
Boston	(617) 245-9600	Miami	(305) 871-4226
Chicago	(312) 694-3250	Minneapolis	(612) 854-4461
Cincinnati	(513) 851-6300	New Jersey	(201) 845-0252
Cleveland	(216) 661-0720	New York	(212) 575-5656
Columbus	(614) 459-0414	Philadelphia	(215) 667-3756
Dallas	(214) 634-2240	San Francisco	(415) 692-4360
Detroit	(313) 557-8844	Stamford	(203) 357-1860
Hartford	(203) 549-0054	St. Louis	(314) 862-3030
Houston	(713) 626-5053	Washington	(202) 785-9222

Or send for complete information.

Four-Phase Systems, Inc.
National Marketing Headquarters
19333 Vallco Parkway
Cupertino, California 95014
(408) 255-0900

Yes, I want to know more about Four-Phase's new 8 station key-to-disc system.

☐ Also send details on other Four-Phase Intelligent Terminal Systems for IBM 2260 & 3270 replacement and remote computing applications.

No. and type of present keystations_____

Name_____

Title_____

Company_____

Address_____

Telephone_____Ext._____

City_____State_____Zip_____



FOUR-PHASE SYSTEMS

5.

Six program levels/job and six accumulators for real-time editing and validation of alphabetic and numeric fields, check digits, algebraic relationships (+, -, ×, ÷, =, ≠, <, >), interfield dependencies, and alphanumeric table comparisons.

6.

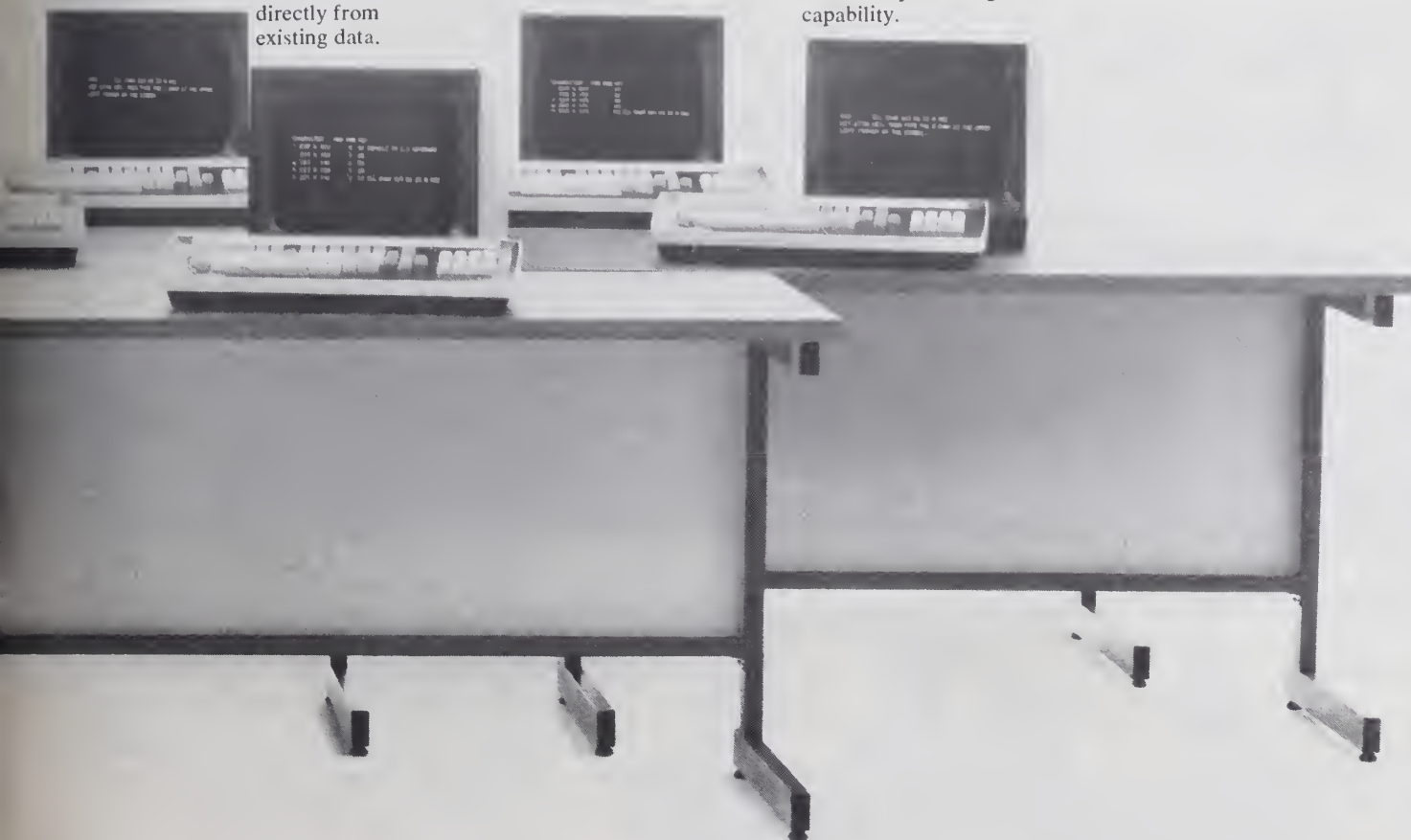
Provision for generating fields such as price-quantity totals, discounts, and taxes directly from existing data.

7.

2.5M byte disc drive stores 20,000 80-character records for continuous keying with minimum disc purging.

8.

24K byte computer is upward compatible with Four-Phase's larger key-to-disc systems for future growth in terminals, peripherals, and processing capability.



User Saves \$2,000/Mo in Paper; Frees Processor Time With COM

MISHAWAKA, Ind. — Dodge Division of Reliance Electric Co., producer of power transmission equipment, has freed computer time and eliminated approximately \$2,000 monthly in the cost of preprinted paper forms by using a computer output microfilm (COM) system.

Dodge has been using a Memorex 1600 Series COM system on-line to its IBM 370/145 since July 1972 for many reports which formerly were printed by slower speed impact printers.

"We have enjoyed a time and money saving operation ever since," stated Don Althoff, manager of data processing services for Dodge. "We use our 370 three shifts, five days weekly; the COM is on-line about 10 hours a week. There just are not enough hours available to tie up our system with an impact printer," he continued.

The maximum rated speed of the COM unit is 10,000 line/min, compared with 1,000 line/min for the IBM 1403 impact

printer on-line to Dodge's 370. COM output consists of microfilm cassettes, the size of a 1/2-in.-tall stack of tabulating cards, which are positioned in desk top viewers for viewing of desired records.

A study completed by Dodge personnel of the volume of COM-produced reports as of last January revealed that paper equivalent forms would then cost an additional \$2,000 monthly. Most of the company's reports converted to COM previously were printed on custom multipart forms.

In addition to improving computer throughput and accruing impressive paper cost savings, Althoff reported several significant operational benefits with the COM system:

- Ease of reference — 18 desk top viewers provide 24x magnification on 11-in. by 14-in. screens and are regarded by Dodge employees as more convenient and up to two-thirds faster than reference to hard-copy binders.

When NOT to Use COM

NEW YORK — Computer output microfilm (COM) is well suited to handling high volume, sequential records in cases where it is feasible to replace paper with film, and where the technique can reduce the number of computer printing passes, according to Joseph L. Kish Jr., president of Iron Mountain Information Management, Inc.

Speaking at the New York Credit & Financial Management Association's annual DP seminar here, Kish noted that COM's biggest problem is updating or notating older records, which may make COM unsuitable for users whose applications require it.

COM is also not the best choice for applications in which the records are to be sent outside the company, since those readers may lack the equipment to use them.

Similarly, COM records don't travel well, Kish noted, again because many sites lack equipment for reading them.

Browsability is another problem, Kish noted. It is simply hard on the eyes to browse through a lot of COM records, Kish noted.

The Federal Government accepts COM records as the official documents, Kish noted, in cases where the user would not normally create a hard-copy version of the same record.

- Reduction of record storage space — each 100-ft microfilm cassette contains 2,400 pages of hard-copy equivalent, a considerable saving of space.

- Handling and distribution — time-consuming bursting and binding of hard copy output is eliminated.

- Legibility — some Dodge reports run up to 10 copies. Multiple COM copies, when required, are equal in legibility to

original copy.

A COM "forms flash" projection system superimposes required lines, columns and headings over printout data.

Viewers are located throughout the company's manufacturing, sales, accounting, market research and industrial engineering departments. Manufacturing records comprise most of the company's COM output. A daily shop floor control report is continually viewed by production schedulers to determine the status of orders in process in various work stages.

The Dodge COM system was installed on a software and plug-compatible basis to its 370 block multiplexer channel. Upon CPU command the system prints 132 character sets at speeds up to 10,000 line/min, close to the writing rate of a 30 kbyte/sec drive.

Alphabetic Handprint Reading from Scan-Data

Another step closer to what data entry can be.

Alphabetic handprint reading.

It opens a new range of data entry applications that can be handled by optical character recognition. And brings you OCR's proven benefits of increased accuracy and throughput; reduced time and labor costs.

Only from Scan-Data.

Mixed media data entry systems that uniquely offer one-key reject handling, and extensive editing and validation capabilities. That make alphabetic handprint reading practical for the first time.

And put us all one big step closer to what data entry can be.

Ask us about alphabetic handprint reading for your application.

SCANDATA

Scan-Data Corporation
800 East Main Street
Norristown, Pennsylvania 19401
215-277-0500 Telex: 846485

'Hands On' Security Keeps Hands Off CPU

NEW ORLEANS — "Prevention" is the key word to the security arrangements at the \$215 million International City Bank, a subsidiary of the ICB Corp. here.

A 12-ft wire fence surrounds the business and financial computer complex. There is also a guard house and an electronic door manned by a receptionist who requires identification before permitting entry. Friendly to its customers, the bank leaves no doubt that it is determined to deter theft and unauthorized intrusion.

ICB recently installed an electronic sentry that restricts access to its highly valuable computer room to only those executives and employees who have been previously authorized to enter.

"With some 20 employees in the DP department involved with our Burroughs and Honeywell computers, the need for a preventive system that would automatically keep unauthorized people from slipping in undetected became apparent," commented Melvin M. Marietta, executive vice-president in charge of the ICB Computer Bureau which serves both the bank and the subsidiary companies.

Has the system interfered with in-and-out traffic?

"Yes," replied Marietta, "and we are quite pleased about this, for it has cut down on unnecessary trips while the necessary ones are made just as before. People think twice before strolling out when they realized they have to check in on the way back."

All personnel with authorized access to the computer center have had their right or left hands photoelectrically measured on the bank's Identimat machine and the dimensions encoded, along with the individual employee number, on a magnetically striped plastic card similar to a credit card.

When the individual wants to enter this restricted facility, he goes to the Identimat terminal stationed at the entrance, inserts the ID card and then places his hand on the face of the unit.

A scanning device reads the hand geometry on the card, compares it with the person's hand on the plate, and if they match, unlocks the door. If they do not match, the door remains closed and a record is made of the unauthorized and unsuccessful attempt at access.



Photographed on location at Eilean Donan Castle, Dornie, Scotland.

There is no stronger shield than "Crashguard."

"Crashguard" is a tough oxide protection against headcrash damage. You get it from the people who developed the first computer tape in 1953. People who will go to any length to solve a customer's problem. People who thrive on assisting. The Data Recording Products Division of 3M. A proud clan.



Call out the clan.

"Scotch" and "Crashguard" are registered trademarks of 3M Company.



ATTENTION: DATA GENERAL USERS

ONLY DECISION OFFERS BIG DISK PERFORMANCE AT SMALL DISK PRICES

New from Decision — A fully integrated, IBM compatible, floppy disk system with these exclusive features

- ☐ read before write address verification
- ☐ 16-bit polynomial divisor CRC check
- ☐ automatic data verification and diagnostic mode
- ☐ full disk operating system with Fortran

All these extra features to ensure ultra-reliability. Our floppy disk controller and system is a compatible extension of our entire line of minicomputer peripherals. Our software is totally compatible for immediate use should applications require upgrading to front load cartridge, top load cartridge, 100 and 200 TPI and the 2314 styles.

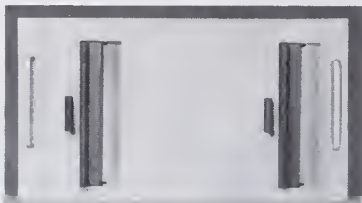
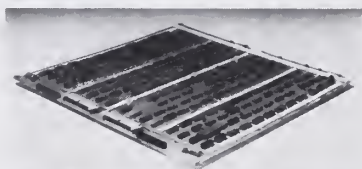
This 19" rack mounted system is rated in excess of

5,000,000 passes per track with the heads in contact with the media. For even longer life, the controller automatically lifts the head when not in use.

Our controller is on a single board, inserts in any Nova-line* mainframe, and can also accommodate a Teletype controller and real time clock. Finally, you get real use out of 4-slot mainframes.

Our concern for media life and reliability will pay you dividends in system value. Delivery for instant plug-in to your Data General Nova in 30 days. For DEC very soon.

DECISION, INC., 5601 College Avenue, Oakland, Calif 94618 or telephone (415) 654-8626.



DECISION

See us at the Computer Caravan

*Trademark Data General

'Agony and Ecstasy Of Integration' To Key Symposium

GAITHERSBURG, Md. — "The Agony and the Ecstasy of Integration" is the title of the keynote address to be delivered by Edward F. Hearle of Booz, Allen & Hamilton, Inc. at the 13th Annual Technical Symposium sponsored by ACM and the National Bureau of Standards.

The conference, "The Systems Ap-

Societies/ User Groups

proach: Key to Successful Computer Applications," will be held June 20 in the Administration Building of NBS here.

Sessions will deal with programming and management techniques, modeling and simulation, data bases and information retrieval, involvement of computer users and hardware/software techniques.

In addition, a panel discussion on privacy has been scheduled.

Registration fee is \$26 for ACM and NBS members, \$28 for non-members and \$13 for students.

Further details are available from Zella Ruthberg, National Bureau of Standards, A265 Technology Building, Washington, D.C. 20234.

Calif. Extension Has 10 Intensive Courses

SANTA CRUZ, Calif. — The University of California Extension, Santa Cruz, has announced 10 computer courses for this summer.

Most of the courses are intensive, meeting eight hours per day, during which the students are resident on-campus.

The courses to be given include: Discrete Systems Simulation Using GPSS-Introductory/Intermediate (July 8-12); Discrete System Simulation Using GPSS — Advanced (July 15-19); Technical Methods for Computer Privacy and Security (July 22-26); Data Base Management (July 29-Aug. 2); Compiler Construction (July 29-Aug. 9); Operating Systems (Aug. 12-23); Advanced Structured Programming (Aug. 12-23); Using Minicomputers (July 15-26); SPSS Statistical Packages (Aug. 5-9); and BMD Statistical Packages (Aug. 12-14).

Additional information is available from the Institute in Computer Science, University of California Extension, 95064.

Calendar

June 20-22, Seattle — Computer Medicine Clinics. Contact: Dr. Michael A. Jenkin, 1974 Program Chairman, 20560 Linden Road, Excelsior, Minn. 55331.

NCC '74 EYEWITNESS REPORT

If you couldn't make it to the National Computer Conference in Chicago, or if you went to the show but find that it's now all beginning to blur and run together, then we can help you.

We're Datapro Research Corporation, and our staff of professional EDP analysts attended the NCC '74 show and prepared a unique report on all important events and exhibits. Called "NCC '74 Eyewitness Report," the document captures all the flavor, excitement and color of the world's largest computer conference. It provides you with an overview of the show and its impact on the EDP Community. Plus individual reports on each exhibit provide you with the following: vendor's name, address and phone number, director of marketing, exhibit's physical specifications, products displayed and demonstrated (with special emphasis placed on new products and their delivery times), unique presentations, literature available and special offers.

EDP users will find NCC '74 Eyewitness report to be very helpful in keeping abreast of the hundreds of new product announcements made at the show, EDP vendors will appreciate knowing how their exhibit stacked up in relation to their competition, and everyone should find it valuable to learn of today's important trends in products and applications.

If you went to the show and things are beginning to get fuzzy, or if you were too busy to attend, Datapro can provide you with an "instant replay"—the NCC '74 Eyewitness Report. Over 200 pages, filled with photographs, handsomely bound, and only \$29.

datapro

DATAPRO RESEARCH CORPORATION
1805 Underwood Boulevard
Delran, New Jersey 08075
609/764/0100

NCC '74 EYEWITNESS REPORT

- ☐ Yes. Please send me your NCC '74 INSTANT REPLAY.
- ☐ My \$29 check is enclosed.
- ☐ Bill me, adding \$2 for shipping and handling.

name _____
title _____
company _____
address _____
city _____
state _____ zip _____
phone _____

Privacy 'Cause' May Beget Unusable Law

By a CW Staff Writer

CHICAGO — "Politicians troubled by Watergate have found the issue of privacy a great diversionary tactic — and it has the earmarks of becoming a cause," Dr. Anita Jones, assistant professor of computer science, Carnegie-Mellon University said here recently.

"I'm afraid this may result in precipitous action, forcing us to adopt policies that we may not be able to implement technologically, let alone economically," she continued. "These policies could hinder us in some future computer applications, and pending legislation should take this into consideration," she said.

Discussing Hydra, a security system now being developed for the Advanced Research Projects Agency (Arpa), Jones said, "Most existing security systems depend on the idea of ownership policy — only the owner can access that information. What we think is important is an environment in which only specific things are accessible in specific ways. This would allow you to access only what you need to know, and in a controlled way, get things you don't own," she said.

Jones suggested a "capabilities" system as a means of protecting access to one's resources, or "objects," such as pages, files and directories.

A "capability" names the object and contains specifications on what operations may be performed on the objects it names. "Possession of a capability is evi-

dence of the right to access that object in specific ways," she said.

Departing somewhat from the theoretical, Daniel Verbois of the U.S. Army Materiel Command, St. Louis, related AMC's experience in establishing security for its systems.

"As users of CDC, Univac and IBM systems, we asked those companies to meet with us to help identify problem areas and develop and implement solutions. Univac had by far the best security features of the three — and CDC did not even respond," he said.

"I don't know if it was because they had no security system to offer us or what. As for IBM,

our meetings were very disappointing. If you have a System 360, forget it. [IBM] did provide, 'free of charge,' the RSS [Resource Security System] but they made it quite clear that we would have to implement the system ourselves — they wouldn't support it," he said.

"The 370, on the other hand, has good stuff," he said.

Research into the cost of encipherment and decipherment as a security technique, currently under way at the University of California at Berkeley, was described by Dr. Lance Hoffman, assistant professor, Department of Electrical Engineering and Computer Science.

Hoffman said he used the re-

sults of these experiments to calculate encipherment time coefficients for four different encipherment methods: one-word key, multiword key, double key and pseudo-random key.

"By interposing a security module between user programs and system input/output routines, we have been able to achieve dynamic security checking with speed approaching that of data-independent decisions in a manner applicable to most operating systems today.

"We plan to extend and improve our preliminary CDC 6400 results on the IBM 360/67 and hope that additional CPU overhead can be cut to well below 10%," he said.

Menard Case 'Impacts' Pending Bills

CHICAGO — "The recent Menard decision will have an important impact on proposed privacy/security legislation now pending because it determined that the FBI is civilly liable for information in its files. Up to this point, the FBI position was that the states were responsible for disposition," said Mark Gitenstein, counsel for the Senate Subcommittee on Constitutional Rights.

The Menard decision, handed down several weeks ago by the Court of Appeals for the District of Columbia [CW, May 1], ruled that the FBI "had no authority to retain the record of Dale B. Menard," who had been arrested in 1965 on suspicion of burglary, yet never charged.

Despite his innocence in the case, his fingerprint card was forwarded by Los Angeles law enforcement authorities to the FBI file where it has remained ever since.

Comparing proposed Ervin and Justice Department bills for privacy protection, Gitenstein pointed out key differences:

First, the bills disagree on how agencies may exchange criminal information. Under the Ervin plan, "only records of conviction can be released to non-law enforcement agencies."

In addition, the policeman on the street will not be given "raw arrest records without dispositions," he said, because of the strong tendency to "arrest that person again."

The definition of "sealing" records was brought up and compared to purging or destroying.

Gitenstein admitted "sealing" was not specifically described in either of the proposed bills, but "to me, sealing simply means those records will be more difficult to access," he said.

Andy Atkinson, supervisor of the Hamilton County (Ohio) Regional Computer Center, suggested one solution for data violations would be a strictly enforced "data release policy," whereby every request for information is filed in writing for consideration by the owner agency before data is released.

"Not only does this control violations, it produces an audit trail," he said.

SHORT TERM
360 LEASES

ROCKWOOD
Computer Corporation

33 W. Tarrytown Road
Elmsford, New York 10523

CALL TOLL FREE
800-431-1781

TO FIND THE OFFICE
NEAREST YOU

LOW-PRICED
acoustic coupler

MODEL 150 . . . NO FRILLS

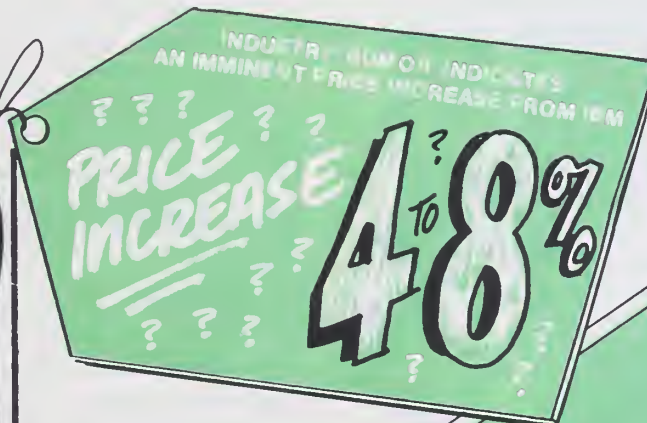
- For use with all Series 33 TELETYPE Terminals
- Half/full duplex switch.
- Carrier indicator.

\$147



ComData member of IDCMA
7544 West Oakton Street
Niles, Illinois 60648
Phone: 312/692-6107

**ARE YOU PLANNING A 158
INSTALLATION THIS YEAR?**



CIS
CONTINENTAL INFORMATION
SYSTEMS CORPORATION

**OFFERS YOU
A SOLUTION
TO IMMINENT
PRICE INCREASES...**

- Prime rates are up - Lease rates will be greater
- Some 370 leasing companies are losing interest in financing systems beyond the mid-point of its life cycle.
- ITC incentive may be reduced or eliminated

**• LOCK-IN AT TODAY'S RATES.
• CIS HAS SEVEN 158's AVAILABLE
WITHIN 90 DAYS FOR PURCHASE OR
LEASE EARLY PURCHASE AND INSTAL-
LATION PERMITS GREATER FLEXIBILITY IN
ATTAINING MORE ATTRACTIVE TERMS.**

- YOU RECEIVE SAVINGS AS A RESULT OF CIS's
POTENTIALLY PRICE PROTECTED POSITION.**
- YOU CAN BE ASSURED OF ITC BENEFIT!**

**MAKE YOUR DECISION NOW TO
RESERVE ONE OF THESE POSITIONS**

**CALL COLLECT
315-474-5776**

**RICHARD J. CAMPBELL
OR FRED P. CHOLETTE**

CONTINENTAL INFORMATION
SYSTEMS CORPORATION
MIDTOWN PLAZA
700 EAST WATER STREET
SYRACUSE, NEW YORK 13210
PHONE 315-474-5776
TELEX 93-7435

CIS
CONTINENTAL INFORMATION
SYSTEMS CORPORATION

NOTHING SUCCEEDS LIKE



AND 70 BOOTHS
HAVE ALREADY BEEN
RESERVED FOR THE
1975 CARAVAN!

In three years, The Computer Caravan has visited 29 cities, attracted more than 80,000 computer users, and produced some remarkable sales results. Next year, we'll be doing it all over again, only better.

The 1975 Computer Caravan is a travelling computer forum and exposition that brings users and marketers together in a unique, information-oriented, business show. And the results are excellent—for everyone.

If you're marketing EDP products and services, now's the time to get the facts on the 1975 Caravan. We've made some interesting changes for next year, and we're planning others. But we'll tell you all about it as soon as we hear from you. Contact your *Computerworld* representative, or call Neal Wilder, Vice President Marketing or Dottie Travis at (617) 965-5800.

The 1975 Caravan Schedule

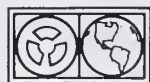
Atlanta	Feb. 24–26
Philadelphia	Mar. 4–6
Hartford	Mar. 11–13
New York	Mar. 18–20
BREAK WEEK	Mar. 23–29
Cleveland	Mar. 31–Apr. 2
Chicago	Apr. 8–10
Minneapolis/St. Paul	Apr. 15–17
BREAK WEEK	Apr. 20–26
Seattle	Apr. 29–May 1
San Francisco	May 6–8

(Optional NCC Add-On at Anaheim, May 19–22)

Regional tours: With preference in space, location, etc. going to full-tour exhibitors, a limited number of regional tours will be available for the '75 Caravan.

The Computer Caravan/75

sponsored by



COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Boston
Bob Ziegel
Mike Burman
(617) 965-5800

New York
Don Fagan
Frank Gallo
(201) 461-2575

San Francisco
Bill Healey
Jerry Thompson
(415) 362-8547

Los Angeles
Bob Byrne
Joseph Ryan
(213) 477-4208

CI Notes

Wilson Named Memorex Head

SANTA CLARA, Calif. — Robert C. Wilson has assumed the position of president and chief executive officer at Memorex Corp.

Wilson, who also is chairman of the board of the troubled peripherals maker, replaces Laurence L. Spitters, the firm's founder, who resigned in April and is now running for Congress here.

Wilson was formerly president and chief executive officer with Collins Radio.

GA Realigns for LSI

ANAHEIM, Calif. — General Automation, Inc. has established two new divisions, prompted by the introduction of the LSI-12/16 microcomputer.

The Advanced Applications Division will develop new standard systems around the microcomputer, under the direction of Al Fiegehen.

The Advanced Product Manufacturing Division, directed by John Theilen, will be responsible for manufacturing functions, connected with products such as the LSI-12/16.

Honeywell Signs Two Pacts

WELLESLEY, Mass. — Honeywell has signed two agreements which give it a further push in the distribution industry.

The first gives Honeywell the marketing rights to an order processing system developed by Comline, Inc. for use on the Series 200 and Series 2000 computers. The second agreement is with George Melhado and Co. for a software system for the Model 58 that provides direct invoicing and instructions to warehouses and drivers in the distribution industry.

Supershorts

Wangco, Inc. has received a contract from International Memory Systems, Inc. for its Series-T disk drives, which will be used in the IMS Data Miser 5000 system and the Data Miser 100 controller.

RCA has developed a low-cost helium-neon laser which is expected to find volume use in such applications as point-of-sale, credit validation devices and optical card readers.

MRI Systems Corp. has assigned European marketing rights for its 2000 data management system to the CAP group of consulting and software organizations.

Mutual Institutions National Transfer System, Inc. (Mints) has arranged with Docutel Corp. and Financial Data Sciences, Inc. to provide automated tellers and cash dispensers to Mints member banks at a discount.

Price Guide Calculates

Used 360s Steady at 25% Of New Price

By Molly Upton
Of the CW Staff

ELMSFORD, N.Y. — Prices on 360s have dropped considerably within the last six months, but now appear to be stabilizing, according to a recent report from Time Brokers, Inc.

Right now a 360/30 is selling for somewhere around 25% of the original price; six months ago it was nearer 30%, according to William P. Hegan, president of Time Brokers.

"The market is very competitive," he added. "In fact, the used computer market is getting to be like the grocery business," he noted, with very little profit margin on each sale.

He estimated that dealers now cannot afford to sell 360s for more than 1% off

the asking price because the margins are so tight.

The 360/30s and 40s are in "available supply" but people have recently been recognizing the bargains around, and activity in this area has picked up, he noted, giving a "floor" to the market.

Peripherals Stable

Although CPU prices have been declining, peripheral prices have shown greater stability. An I/O set, consisting of a 2540 card reader/punch, 2821-1 control unit and 1403 N1 printer has sold for between \$90,000 and \$92,000 the past year.

Time Brokers' *Computer Price Guide* lists 2821 control units with an 1,100 line/min printer adapter between 84% and 72% of original cost.

1982 European Terminal Market Expected to Total \$1 Billion

By Toni Wiseman
Of the CW Staff

NEW YORK — The computer terminal market in Europe is expected to triple by 1982 to nearly \$1 billion, according to a study by Frost & Sullivan, Inc.

"All told, the delivery of computer terminals to European markets will come to \$7 billion over the next 10 years," the market research firm said.

Terminal shipments in 1973 amounted to \$388 million.

The banking terminal market alone accounted for \$79 million in 1973 and, according to market predictions, will climb to \$245 million by 1977. The market will then stabilize as large networks are progressively installed over a number of years.

Conversely, the point-of-sale market which accounted for only \$60 million in 1973, will experience rapid growth during the 70s, with cumulative shipments over the next 10 years amounting to \$742 million, Frost & Sullivan predicted.

Markets for applications- and industry-oriented terminals are beginning to develop, the report said, mainly in the areas of industrial data collection, cash receipting and ticketing.

The report estimated annual shipments of this class of terminals at \$20.2 million in 1973, rising to \$74.5 million by 1982, with a total of \$455.6 million over the period.

Video display units will be used increasingly during the next decade, the report said, with shipments rising from \$10 million in 1973 to \$23.8 million by 1982.

Europe must be viewed as several individual markets, the report said. "It is necessary to understand the political, cultural and language variations among the countries to understand the different ac-

counting procedures and corporate laws, which also vary widely," it stated.

Germany, the UK and France will be responsible for two thirds of the value of terminal shipments in the 1973-82 period, the report said. However, terminal usage will be high on a per capita basis in the smaller countries, and less developed nations such as Spain and Italy will show the highest growth rates.

Specifically, for the period of 1973 to 1982, Germany will account for \$1.8 billion in terminal shipments, France for \$1.3 billion and the UK for \$1.5 billion. Italy and The Netherlands will account for \$572.8 million and \$224.4 million respectively, while Sweden, Norway and Denmark together will account for \$529.6 million.

Xerox Anticipates Broad Future

CW West Coast Bureau

SANTA MONICA, Calif. — Xerox Corp.'s computer strategy for the future is aimed at broad-based information systems and not just computers, C. Peter McColough, chairman of the board and chief executive officer, said.

At a press conference following the company's annual meeting last week, McColough said there is no intention to launch an across-the-board business data processing effort in competition with IBM.

In fact, in answer to a stockholder's question at the annual meeting, he said he was not in favor of breaking up IBM. "I don't favor splitting up IBM. They have succeeded on the basis of the products and their services. They are a great American company and a great American asset," he said.

McColough said Xerox wants to use its

digital capabilities in combination with its graphics, transmission and display capabilities.

He cited the company's new 1200 line printer as an example of a blend of the Xerographic techniques of imaging and the digital capability of computers.

He said Xerox is aggressively looking for companies to acquire to complement its present capabilities as does Diablo Systems, Inc., which he described as "profitable and growing."

The computer operations, he said, now provide about 5% of Xerox's revenues although those operations still lose money. The losses from computer operations last year were less than half those of the preceding year, he said, and termed the reduction "quite dramatic."

McColough estimated it would be one to two years before the computer operations become profitable.

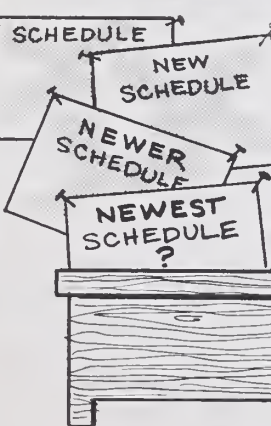
Some peripherals, however, have not fared so well, such as the 2311 disk drive and the 2841 controller which have "continually declined in price, and we do not see any rapid change in this situation," the book said. The reason is that the capacity is so small, the 2311 "just can't cut the mustard in today's system design market."

The 370s are appearing on the used market with some regularity, notably the 155. The book listed one for sale at 56% of original price.

Hegan explained that the 158 "really clobbered" the 155s, adding that many users with purchased 155s had changed their minds in favor of the 158.

As yet, there are not many System/3s on the market, principally because most of these machines are leased, rather than purchased. The maintenance costs on System/3s are relatively high, he explained, which discourages users from buying them.

A few more little changes!



Why didn't we buy PROJECT CONTROL 70?

A familiar problem? PC/70 is a planning tool that can help you.

Contact: Robert P. Wolk, V.P.



Atlantic Software Inc.

Lafayette Building, 5th & Chestnut Sts.
Philadelphia, Pa. 19106 • 215-925-8424

☐ Please send us literature about PROJECT CONTROL/70

Name _____

Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Telephone (_____) _____



**VOLUME
KEY PUNCHING**
(402) 346-0330



**"JUST
MINUTES
AWAY"**

**AMERICAN
KEY PUNCH**

Redick Tower
Omaha, Nebraska 68102
and Ft. Worth, Texas

**COMPLETE
LOW COST
DATA-ENTRY SERVICES**

OCR SERVICES
SCANNING: HANDPRINT • OCR A
MARK READ • COMPUTER PRINT

OCR TYPE/SCAN

KEYPUNCH • KEYDISC/TAPE
UNIVAC • IBM • CMC

**DATA-MIDWEST
CORPORATION**

7803 BLOOMINGTON AVE. SO.
MPLS. MN 55420, (612) 854-5522

4 MIN. FROM MPLS-ST. PAUL INTL. A.P.

From Communications to Informatics

Conferences, Trade Fairs Invade World Scene

A series of conferences ranging from communications to economics to minicomputers is in store for the industry on the international scene this year.

Communications 74, at the Metropole Convention Centre, Brighton, England, will run June 4-7. Communication systems ranging from maritime and military satellite systems to a host of data communications equipment will be on display.

Further information to Communications 74 is available from Andrew Stevens, 21 Market Place, Wokingham, Berkshire, RG11 1AP, England.

Minifest 74, an international exhibition for the minicomputer industry, will be held concurrently with a special course on "Minicomputer Evaluation and Selection 74."

In addition to the exhibition and the course, a number of informal lectures will be held, for manufacturers to communicate the latest information about this technology. Exhibitors in-

clude Computer Technology Ltd., National Semiconductors UK, R2E, Sintrom Electronics Ltd. and Data Dynamics.

Further details on Minifest 74, which will be held June 3-5 at the Regent Center Hotel in London, are available from Dr. Yakup Paker, Polytechnic of Central London, 115 New Cavendish St., London W1M 8JS, England.

A seminar on "Minicomputers and Applications" is being organized by the Polytechnic of Central London with the Polish Cybernetic Society and the Polytechnic of Lodz.

At the seminar, June 20-22 in Lodz, Poland, a British team of experts will be lecturing on modern minicomputer technology and its impact on the process control and telecommunication fields in the UK, while a Polish team will be covering the same themes, reflecting the Polish experience.

Details on the seminar are also available from Paker of the Poly-

technic of Central London.

The U.S. Department of Commerce will be staging commercial exhibitions of American-made DP products at three international trade fairs in Eastern and Western Europe later this year.

Electronic data processing equipment will be on display at

International News

the 16th International Engineering Fair in Brno, Czechoslovakia, Sept. 11-19. The emphasis will be on digital computer, microfilm systems and reservation systems for hotels and tourist agencies.

Bucharist, Romania will be the site of an international fair Oct. 13-22, where industrial process instrumentation and control equipment will be featured.

Finally, electronic components, production equipment

and measuring and testing instrumentation will be the prime targets at Electronica '74 in Munich, Germany, Nov. 21-27.

For information on these three shows contact James Rourke, U.S. Department of Commerce, Washington, D.C. 20230.

The Intergovernmental Bureau for Informatics is sponsoring a symposium on the economics of informatics, Sept. 16-20, in Mainz, Germany.

Presentations will deal with the economic considerations of national policy plans, the effectiveness of information systems, defined as the degree of assistance the users can expect, and the efficiency of information systems, defined as the least expensive means used to perform the given task.

Further details on this conference are available from Prof. Malcolm Gotterer, Dept. of Mathematical Science, Florida International University, Lamiami Trail, Miami, Fla. 33144.

Singer Sees Overseas Markets Opening For Small System 10, 1500 Terminal

By Toni Wiseman
Of the CW Staff

NEW YORK — Singer Business Machines' international division is going ahead full steam, taking advantage of opening markets for its small System 10 computer and the newly acquired 1500 intelligent terminal.

Singer has wholly owned subsidiaries in all of the countries of Western Europe with the exception of Denmark, Gordon Smith, vice-president of international marketing, said, as well as in Australia and most of the countries of Latin America.

"We do about \$100 million worth of business overseas annually," he said, noting the international operation accounts for some 4,000 employees, of which 1,200 are field engineers and the balance sales and sales support people.

Overseas facilities include a plant in Holland where the "older items in the line" are being manufactured, Smith said, such as flexowriters and billing and accounting machines, "which was of course the backbone of Friden's original business."

Seeking Multinational Accounts

Singer's marketing approach for Europe is pretty much the same as in the U.S., Smith said. "We are going after the larger multinational accounts, perhaps to a greater degree, trying to convince them of the concept of using the very large computer, like the IBM 370/165, and then using our intelligent terminals to come into them. And in the process, [we're] trying to replace the medium-scale computer which we consider obsolete."

Smith noted that the overseas billing and accounting sales force is being converted to the newer line of equipment. The older line is not being phased out, simply not pushed as hard, he said.

The System 10 is the biggest single item of sales, Smith stated. "It's a very reliable piece

of equipment," he said, "not very fast by normal standards, but it doesn't have to be because you're really treating the speed with which [someone] can enter [data] on a keyboard or cash register."

The System 10 is very big in distribution markets, he said, in companies keeping track of inventories at several warehouses and then doing the billing and accounts receivables and purchasing.

The warehouse market is also opening up for the Singer 1500 intelligent terminal, Smith noted, because the operator can key in the information at the warehouse location and then either on an on-line real-time basis or at night transmit by tape what has happened during the day.

Banking Business

Singer is also developing a system for banks using the 1500 unit with a disk as the central unit, fed by another 1500.

The impetus for this development, he said, is the involved

recordkeeping in Europe where law requires that any day in which there is a transaction, the bank must produce a statement for that account. Singer is currently experimenting with three banks to see if the daily transaction time can be speeded up.

Since June 1973, production of the 1500 has grown from 40 units to 200 units a month, Smith said, with international bookings for over 1,000 units, which amounts to some \$12 million. Singer has already shipped 800 units into Europe.

And it has been predicted that "the worldwide market opportunities in the next three and a half years would be 65,000 terminals internationally and 80,000 in the U.S.," Smith added.

The company has no immediate plans for future production facilities, Smith said. "The big difficulty at the moment is the dollar revaluation up and down over the last year or so," he said. "It leaves you in somewhat of a quandary as to where it's best to build."

Foreign Orders & Installations

Nissan Motor Co., Ltd., manufacturer of Datsun cars, has placed a \$1.8 million order with NCR Japan for 50 NCR 399 accounting computers. The order represents the first step in a three-year project to establish a standard system linking the Nissan Motors factory to its medium-size dealers.

Registro Italiano Navale, Genoa, an organization giving advisory and technical support to the Italian Merchant Navy, will install a Univac 90/70 system in September. Valued at \$1.3 million, the computer will be used for administration, ship register file processing, ship structure design, hydrostatic and hydrodynamic calculations and

interactive optimization techniques.

Barclays Bank of England has installed 12 additional Incoterm SPD 10/20 intelligent terminals, with a contract value approximating \$80,000, for use in a data communications network.

Science Research Council's Rutherford Laboratory, Chilton, England, has ordered a GEC 4080 from GEC Computers Ltd. for on-line connection to the laboratory's IBM 370/195.

British-American Insurance Co., Kingston, Jamaica, is enhancing its ICL 1902A with three EDS60s, 16K of core and an increase in processor speed to the 1902S level.

WANTED TO BUY

370/145

PRINCIPALS ONLY PLEASE

CW Box 4114
797 Washington Street
Newton, Mass. 02160

Computerworld Sales Offices

Vice President—Marketing: *Neal Wilder*. Sales Administrator: *Dottie Travis*. Computerworld, 797 Washington St., Newton, Mass. 02160. Phone: (617) 965-5800. Telex: USA-92-2529.

Northern Regional Manager: *Robert Ziegel*. Account Manager: *Mike Burman*. Computerworld, 797 Washington St., Newton, Mass. 02160. Phone: (617) 965-5800. Telex: USA-92-2529.

Eastern Regional Manager: *Donald E. Fagan*. Account Manager: *Frank Gallo*. Computerworld, 2125 Center Ave., Fort Lee, N.J. 07024. Phone: (201) 461-2575

Los Angeles Area: *Bob Byrne*. Robert Byrne & Assoc., 1541 Westwood Blvd., Los Angeles, Calif. 90024. Phone: (213) 477-4208.

San Francisco Area: *Bill Healey*. Thompson/Healey Assoc., 1111 Hearst Bldg., San Francisco, Calif. 94103. Phone: (415) 362-8547.

Japan: *Ken Suzuki*. General Manager, Dempa/Computerworld, 1-11-15 Higashi Gotanda, Shinagawa-ku, Tokyo 141. Phone: (03) 445-6101. Telex: Japan-26792.

Experts Tell Company Managers

'Experienced People' Top Criterion in Raising Capital

By Nancy French
Of the CW Staff

CHICAGO — Managers of computer companies looking for capital for expansion heard "what to look for" and "what to look out for" from venture capital experts at a panel session here recently.

"Our single most important criterion in evaluating a company is people with experience — a track record to show us. A 26-year-old MBA is 'dead as a dodo' to us," said John Doede, a financier with the First Chicago Investment Corp.

"We don't invest much in the computer and telecommunications area any more because there are better places to put your money," he said, "but when we do, here's what we look for:

"After people with experience, we look for a reasonable and well-reasoned business plan, including a detailed analysis of the market.

"Next, we look for a good financial analysis — an accurate determination of how much cash will be needed.

"Only then do we consider the product — whether it is a good one and whether it is feasible," he said.

Going Public

Addressing himself to the public financing sphere, Ned Jannotta of William Blair & Co., Chicago, pointed out that a company should have a good reason for going public. Some reasons he listed as good are: need for additional capital, liquidity for stockholders, and desire to establish a market to be used for acquisition.

"We have seen in the past many companies go public as a badge of accomplishment — something to be talked about on the golf course," he said.

"Being a public company has many built-in headaches," he pointed out. "Instead of just customers, suppliers and employees to deal with, 'you develop a whole new constituency — stockholders — most of whom will have no idea of your problems,'" he said.

Jannotta had these words of caution to the company going public:

In selecting your investment banker, use all the existing professional advice you can get. "Talk to your lawyer, your bank," he urged.

Then, when you look for your underwriter, "talk to more than one, but don't scatter your shots," he warned.

"The guy who lost your business will find reasons for not wanting your business anyway, and when you have to come back in a year or so — and more than likely you will, he will be more difficult to deal with," he said.

As for costs, Jannotta pointed out that it would cost about 11% to underwrite a public offering — with the underwriter's fee discount alone 7%.

As for lead time, Jannotta estimated 90 to 120 days to prepare a registration statement, and another 45 to get through the Securities and Exchange Commission.

Doede added that the price of capital would range anywhere from 20% to 40% of equity.

Sample Case

Gene Amdahl's personal experiences in financing his then infant Amdahl Corp., Sunnyvale, Calif., illustrated all the general rules cited by the first two speakers.

"Our initial investment of \$2 million, which was increased to \$2.5 million shortly thereafter, came from the Heizer Corp. in Chicago," he said.

"Our second investment, a year later, came from the Japanese firm Fujitsu, and benefitted us both. They were looking for a joint development program as well as an investment, and they were strong technically and financially as well," he explained.

When it all worked out, Amdahl said he was delighted, but there were a few rough moments before the deal was closed.

"During the course of their investigation of our company, I was beginning to feel that perhaps they were learning too much inside information," he said. "But Fujitsu turned out to be a very honorable company. The deal brought in \$5 million.

"A year later we began looking for more capital — this time from a public offering. At the time we were still in the development stage — not a single machine had been sold," he said.

"We filed with the SEC, but we couldn't raise any public money. We retracted our horns and went back to the private market, but that looked as bad as the public had," he explained.

"Fortunately Fujitsu decided our company had to succeed — at the very least to exist — for them to complete our joint activity. They put in \$6 million more, with agreements of more to come," he said.

According to Amdahl, getting money

took first, a good business plan with a rather unique product.

'It Took Faith'

"We were developing a new technology — high speed integrated circuits," he explained. "It took faith from Heizer," he added.

"The basis of that faith was the reputation for achievement of those who came into the company."

He explained that the market for the product was large enough to support, but small enough to be managed by, a small hard-hitting sales force.

"The sale of one unit represented enough money to support a local sales/service effort," he explained.

"We did have to prove we were clean," he said, "that we were not using any of IBM's technology or designs. We showed our potential investors that we were meeting IBM peripherally, rather than

head on, with a compatible system that used the same software," he said.

In discussion that followed, moderator Robert Johnston of Johnston Associates, New York, pointed out that it's important to feel comfortable with your investors. "In that regard, it's a little like getting married," he said.

Same Investor

He reminded attendees that it is typically necessary to go to the same investor several times for money.

"If they don't want to refinance, it's a bad sign," he said.

As for the investor wanting to establish control or place restrictions on the company to save his investment, Doede said that is also a bad sign.

"When I'm investing, I don't want control. A good management should know better than I, what they should be doing," he concluded.



First, again.

Nashua brought you the first independent disc cartridge for the System/3. The first independent disc pack for IBM* 3330 Drives. The first improved weighting system for 3336-type disc packs.

Now Nashua has done it again: the first independent disc pack for 3330 Drives that have been converted to double density.

This advanced Nashua 4436DD stores up to 200,036,000 Bytes of data, and is factory-formatted to assure absolute system compatibility. Like our 4436 single density disc pack, it has the unique weighting system that prevents drive damage — and downtime.

Nashua's extra-critical quality control means our 4436DD will meet or exceed IBM's own specifications. Yet with all this going for it, the Nashua 4436DD definitely saves you money. Go with the first team. Write or phone Nashua Corporation, Nashua, N.H. 03060. Telephone 603-883-7711.

NASHUA
The First Team

*Registered trademark of International Business Machines Corporation.

Position Announcements

SR. MARKETING SPECIALIST

Military Computers

Due to new and continuing programs, Litton Guidance & Control Systems offers an excellent opportunity to a qualified individual to become a key member of Advanced Programs Marketing, with the responsibility to continue establishing the company as a significant supplier of military, ground, shipboard and airborne computers.

The individual sought must have a demonstrated capability in aerospace computer advanced programs marketing. Activities will include market plans and marketing of the existing product line, advanced technology and specifying the requirements for product development. Prefer 7-10 years experience in the marketing of aerospace computers.

For immediate consideration, send resume to:



GUIDANCE & CONTROL SYSTEMS
5500 Canoga Avenue
Woodland Hills, Calif. 91364

An equal opportunity employer M/F

PROGRAMMERS/DIGITAL DEVELOPMENT ENGINEERS-MINICOMPUTER OPERATING SYSTEMS DESIGN

Our client, a Major Local manufacturer of Computer Systems Products, has immediate openings for Programmers and Digital Development Engineers. Successful Software applicants will have experience in Systems or Applications Software Development, and strong ASSEMBLY LANGUAGE Programming background, or Operating Systems Design background, on Small, Medium or Large Scale Systems. Challenging assignments are available at various levels in Development of Software for Executive, File Management, Communications Controller and Terminal Procedures Components of Operating Systems for Real-Time, Multiprogramming, Multitasking, Minicomputer Systems. Hardware openings as specified below:

Digital Logic Design Engineers: 1-3 years of experience with Digital Logic (TTL) and circuitry with the Computer and peripheral equipment field.

Digital Peripherals Development Engineers: 3-5 years in design and development of Peripheral Controllers and I/O subsystems from original concept through production.

Compensation is open, based on experience. Client company is an Equal Opportunity Employer M/F.

Qualified candidates will receive immediate consideration and are urged to contact Mr. Robert Kleven, in strict confidence, at (617) 861-1020, or to submit confidential resume with current salary information to him at One Wallis Court, Lexington, Massachusetts 02173

nk Norton, Kleven and Co., Inc.

Industrial Relations Management Consultants

Member Massachusetts Professional Placement Consultants

software programmers

Rewarding career opportunities for dynamic, results-oriented programming professionals with Sperry Vickers, the world leader in the fluid power industry. Will be involved in:

- Designing specialized utilities and library routines.
- Technical review and building of hardware and software configurations and packages.
- Improvement of existing routines.

If you have sound knowledge of large scale operating systems, preferably UNIVAC 400 or 1100 series, and assembler language, this is the position for you! Familiarity with FORTRAN or COBOL a plus. We are a multinational company operating a UNIVAC 1108 under Exec 8. Our modern facilities are located in an attractive suburb north of Detroit.

We offer an excellent compensation package, liberal company benefits plus a realistic opportunity for personal growth and recognition.

Please send resume & salary requirements to:
PERSONNEL DEPARTMENT

SPEERRY VICKERS
POWER AND MOTION CONTROL SYSTEMS

P.O. Box 302, Troy, Mich. 48084

An Equal Opportunity Employer (Male/Female)

POSITION ANNOUNCEMENTS

ARE YOU AN AGGRESSIVE COMPUTER PROFESSIONAL?

The dynamic city of Houston, Texas may offer you the future you have been looking for. Over 800 companies in Houston will see your qualifications. Why not drop your resume in the mail today to the attention of Ron Rutherford.

NOTHING VENTURED — NOTHING GAINED!
ADDINGTON & RUTHERFORD
Personnel Consultants
Financial and E.D.P. Specialists
710 North Post Oak, Suite 317
Houston, Texas 77024
(713) 688-9881

Brown University

Office of Academic Computing Services has an opening for a programmer analyst to help faculty and students to solve their problems on Brown's IBM 360/67 system. Apply to:

Professor Walter Freiburger
Box F, Brown University
Providence, R.I. 02912

PROGRAMMER

An opportunity to join a progressive company with a growing service bureau located in small town. This position offers a splendid opportunity for the right person who doesn't work by a time clock. Liberal benefits including hospital and major medical insurance. All replies confidential. Send complete details to:

CW Box 4097
797 Washington Street
Newton, Mass. 02160

Itty Bitty Monopoly **Service Systems Sales**

We're specialists in IBM "Customer Engineer" Extractions.

Bill Gill **And Associates**

Salary \$1300-\$1800/month
5724 W. Diversey Av.
Chicago, Ill. 60639
(312) 622-7711

DATA PROCESSING INSTRUCTOR

Join Aetna Life & Casualty as an instructor for the Aetna Data Processing Education Program. As such you will: teach courses in COBOL, BAL, JCL, computer concepts, abdump analysis, CMS, introductory systems analysis; develop new and revise existing courses; implement setting up courses. Should have two years DP experience including COBOL programming, a knowledge of OS JCL and some teaching experience.

If qualified, send resume to:
Craig Mackey
Employment Office
Aetna Life & Casualty
Hartford, Conn. 06115
An equal opportunity employer



DOS/OS SYSTEM PROGRAMMERS

Successful software firm has nationwide openings for System Programmers. We are progressing at a rapid rate with a variety of state-of-the-art products. To qualify one must have three-five years of IBM operating systems, assembly and COBOL language programming experience.

Excellent starting salaries, fringe benefits and, if necessary, paid relocation. For consideration, send your resume or letter of application to:

H.R. Heidler
Vice President,
Technical Services
Value Computing, Inc.
496 N. Kings Highway
Cherry Hill, N.J. 08034

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

SOFTWARE OUTSTANDING SALES AND TECHNICAL OPPORTUNITIES

The leading producer of Corporate Financial Reporting Systems is expanding in selected locations. We offer unusual opportunities to sell and implement the World's No. 1 General Ledger and other Financial Reporting Systems.

SALES REPRESENTATIVES... must be successful, with proven track record. Hardware, software sales experience necessary.

SYSTEMS REPRESENTATIVES... minimum 3 yrs. experience in design of accounting applications. Must know COBOL and data base design. Customer training, some travel to be expected.

OPENINGS IN: Boston, Chicago & New York

SOFTWARE INTERNATIONAL

Elm Square, Andover, Mass. 01810 (617) 475-5040

computer professionals ask your computer friends who've made the rounds.

They'll tell you that the professionals at the ESP Associates Agencies have been the single most potent force in their career advancements.

Why not find out for yourself? Simply contact our office nearest to you. You'll see opportunities you never knew existed... in your own city... or anywhere else, if relocation is your objective.

esp associates

CLEVELAND
McCormick & Associates, Inc.
601 Rockwell Avenue
Cleveland, Ohio 44114

DALLAS
Data Processing Careers
Suite 1109
Stemmons Tower West
Dallas, Texas 75207

DETROIT
Electronic Systems Personnel
1705 Fisher Building
Detroit, Michigan 48202

HARTFORD
Compass, Inc.
900 Asylum Avenue
Hartford, Connecticut 06105

KANSAS CITY
Electronic Systems Personnel
370 TenMain Center
Kansas City, Missouri 64105

LOS ANGELES
Career Data Personnel Agency
Suite 323
3303 Wilshire Boulevard
Los Angeles, California 90010

MILWAUKEE
EDP Consultants
11430 W. Bluemound Road
Wauwatosa, Wisconsin 53226

MINNEAPOLIS/ST. PAUL
Electronic Systems Personnel
801 Nicollet Mall, Suite 1716
Minneapolis, Minnesota 55402

PITTSBURGH
Electronic Systems Personnel
106 Lawyers Building
428 Forbes Avenue
Pittsburgh, Penna. 15219

SAN FRANCISCO
The Computer Resources Group
303 Sacramento Street
San Francisco, Cal. 94111

ST. LOUIS
Christopher & Long
7777 Bonhomme, Suite 1801
St. Louis, Missouri 63105

WASHINGTON, D. C.
ESP Systems Corporation
Suite 704
1211 Connecticut Ave. N.W.
Washington, D. C. 20036

Even Webster's Knows About QUEST

QUEST (kwěst) v. 1. To make a search; to go on a quest

QUEST SYSTEMS, INC. n. 1. A corporation founded in 1968. 2. The largest professional recruitment firm in the U.S. functioning solely in the computer sciences; its client companies pay all employment fees, interviewing and relocation expenses. Quest is known for its deep personal commitment to relate to each candidate as an individual with individual goals. 3. Its professional staff averages over 6 years of experience in EDP recruiting (additionally, staff members have direct hands-on experience in programming, systems, hardware sales, etc.) 4. Quest is presently searching for degreed programmers and analysts (commercial, scientific, systems software) for over 3,500 client companies in the U.S. Quest has openings in over 700 U.S. towns and cities. 5. Methodology — see Questsystem.

QUESTSYSTEM (kwěst sis'tēm) n. 1. Discussing with a man what he would like to be doing in light of what he has been doing. 2. Analyzing the realities of his objectives as they relate to the current job marketplace. 3. Contacting client companies and other Quest staff personnel to identify positions of possible interest. 4. Introducing the job candidate to his prospective employers by providing complete details to each about the other, ensuring the efficacious use of everyone's time. 5. Arranging interviews. 6. If employment offers are extended, Quest assists in evaluating the responsibilities, compensation and opportunities (and relates those to the initially stated objectives). The Questsystem has been working for thousands of professionals at no expense, whatsoever. Ask your friends of their past dealings with Quest. Then, put the Questsystem to work for you. For additional information on this subject, please inquire directly to Quest Systems, Inc. (All inquiries/resumes received will be responded to immediately and in confidence).



QUEST SYSTEMS INC.

6400 Goldsboro Road
Washington, D. C. 20034 (301) 229-4200
Baltimore (301) 265-1177 • Philadelphia (215) 667-3322

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

PROJECT LEADER - ADMINISTRATIVE SYSTEMS

LOCATION: State of Wisconsin/Department of Transportation, Bureau of Systems and Data Processing in Madison.

DUTIES: Direct the project team responsible for development, implementation and maintenance of department wide administrative systems (AMS) consisting of budget, financial, personnel, and other related areas.

PAY: Start between \$1240 and \$1375 per month (effective July 7, 1974) depending upon the individual's qualifications and experience.

REQUIREMENTS: Degree in Business or Public Administration (or related field) and 3 years of progressively responsible professional data processing and management information experience, two years of which must have involved the development and implementation of complex administrative systems as the leader of a project team. Must have demonstrated ability to work with top management to identify and provide for systems needs.

APPLY: Send complete resume with description of the major projects you have directed to State Bureau of Personnel, 1 West Wilson Street, Madison, Wisconsin 53702 by June 14, 1974. Please indicate on the front of resume, Management Information Specialist 5-Transportation.

Software Product Support Managers

Digital is currently seeking qualified professionals to plan for and determine software support activities for products in the following market areas:

Laboratory Data Products
Computational and Engineering Applications

Bio-Medical Applications

Educational Systems

An outstanding career opportunity is available to you if you have at least five years of field software services and field management experience for a computer manufacturer . . . If you have interest and experience in the business and planning aspect of software engineering and services associated with any of the market areas listed above . . . If you are especially challenged by the minicomputer revolution.

Specific duties may include: budgeting for corporate software support activities, determination and planning for the support of a software product, influencing the development of a software product and measuring, analyzing and reporting of worldwide support activities.

Manager Software Development Computer Facility

This is an opportunity to head up one of the world's largest computer facilities for minicomputer software development. Assuming responsibility for multiple site operations with over 20 computer systems and numerous terminals, you will be involved in total facilities management, including the operation, staffing and expansion. The positions represents a real challenge for a professional who has demonstrated ability in managing a computer facility preferably in the area of software development.

The scope of this position requires a manager who is aggressive, and capable of running an efficient facility within a demanding and expanding environment.

Previous computer facilities management experience is a must, experience with the PDP-8 and PDP-11 is most desirable.

Please direct your resume to Joe Underwood, Digital Equipment Corporation, 162 Main Street, Maynard, Mass. 01754.

digital

digital equipment corporation

The above positions are open for application to women and men regardless of race, national origin, age, religion or creed.

SALES OPENINGS

Marketing professional who knows systems software and can identify with a large sales organization. Customer base includes over 200 of Fortune's 1000 companies. Compensation offers a realistic 40K plus potential. Stock options, additional benefits, full expenses.

Send resume to G.L. Lavine, National Sales Manager

Openings in:

New York

Atlanta

Chicago

Kansas City

Dallas

Los Angeles

Value Computing Inc.
496 N. Kings Highway
Cherry Hill, N.J. 08034

EDP SYSTEMS ANALYST

Overseas

The Arabian American Oil Company is seeking an Electronic Data Processing Analyst with degree in Physical Science, Engineering, Mathematics or Business Administration; with 4-5 years experience in at least one of the following systems: COMMERCIAL-ENGINEERING & SCIENTIFIC-OPERATING or DATA BASE/DATA COMMUNICATIONS.

Complete family living facilities similar to modern suburban communities in the U.S. Send comprehensive resume to:



Employment Supervisor

ARABIAN AMERICAN OIL COMPANY

1345 AVENUE OF THE AMERICAS
NEW YORK, NEW YORK 10019
An Equal Opportunity Employer

APPLICATION PROGRAMMERS

Changing technology and rapid growth has created several openings in Denver's largest financial data processing center. Programmers must have a min. of 1 yr. exp; and programmer analyst needs 2 to 3 yrs. exp. using COBOL on 360 or 370 utilizing D.O.S. or O.S. send resume and salary requirements to:

T.A. Box 5808
Denver, Colorado 80217
An Equal Opportunity Employer

COMPUTER CENTER DIRECTOR

Appointment to be effective September 1, 1974. Major responsibility for managing and directing the University's computer services. M.A. degree required in computer science or related field plus at least 6 years experience in computer operations, preferably at a university. Resume should include employment history and salaries plus a summary in applicants own handwriting concerning his or her qualifications. Send resume and salary requirements by July 15, 1974 to:

W.O. WITHERSPOON
Idaho State University
Pocatello, Idaho 83209
An Equal Opportunity/
Affirmative Action Employer

ASSIGNMENT IN TEHRAN, IRAN

360 OS SYSTEMS PROGRAMMERS
IMS SYSTEMS PROGRAMMERS
IMS APPLICATIONS PROGRAMMERS
STATISTICS/ECONOMICS/FORTRAN PROGRAMMERS

Send resumes and salary history to

TSC

2924 Red Lion Lane
Silver Spring, Md. 20904

COLLEGE COMPUTER CENTER

A CUNY Senior College is currently recruiting for several positions at the Computer Facilities. A major effort in designing and implementing a Management Information System for the College has made the following positions available.

Title: Manager of Utilization Control
Duties: Provide user support services for all established Administrative Systems

Requirements: A minimum of 4 years experience, background in COBOL, familiarity with medium to large scale computers. BA degree.

Title: Project Leader
Duties: Assume responsibility for complete project management

Requirements: A minimum of 4 years experience, background in COBOL, some supervisory experience. BA degree.

Title: Assistant Project Leader
Duties: Assist project leader in design of MIS package
Requirements: A minimum of 2 years experience, background in COBOL, OS helpful. BA degree.

Please state salary requirements.
Equal Opportunity Employer M/F.

CW Box 4110
797 Washington St.
Newton, Mass. 02160



Real-Time Software is our product.

Make GTE Sylvania and San Francisco part of your career future.

New long term contracts have just been awarded to our Electronic Systems Group, Western Division, in Mountain View south of San Francisco. In most instances these positions will offer you an opportunity for involvement and rewards beyond your current position and responsibilities.

Our newly formed Software Engineering Department is expanding rapidly in order to keep up with our accelerated growth. Programmers and Analysts who join us will help us expand the state-of-the-art in such areas as *MULTI-PROCESSING, *MULTI-COMPUTER NETTING, *DATA MANAGEMENT, *SIGNAL PROCESSING, and *OPERATING SYSTEMS.

Senior positions require 8 or more years of applicable real-time experience. Successful candidates should have a proven track record in one or more of the following areas: *REAL-TIME SYSTEMS DESIGN AND IMPLEMENTATION, *MANAGEMENT OF REAL-TIME SOFTWARE PROJECTS, *TECHNICAL MARKETING SUPPORT.

Junior positions require up to 3 years of experience in assembly language, CMS-2, FORTRAN or a real-time oriented HIGHER ORDER LANGUAGE. A degree in EE Computer Science is desirable.

Your relocation will be paid to the San Francisco Peninsula where you will enjoy associating with leading professionals who have carved their careers in our organization. If GTE Sylvania sounds like your kind of company, then make us part of your future now. Send your resume to Professional Staffing Director, Dept. CW-20, P.O. Box 188, Mountain View, California 94040. An equal opportunity employer, male/female. Minority applicants are encouraged to apply. U.S. Citizenship is required.

GTE SYLVANIA

POSITION ANNOUNCEMENTS	POSITION ANNOUNCEMENTS	POSITION ANNOUNCEMENTS	BUY SELL SWAP	BUY SELL SWAP
------------------------	------------------------	------------------------	---------------	---------------

PROGRAMMER

Opportunity available with a large national manufacturer of plastic pipe and fittings in our Louisville, Kentucky facility. Excellent fringes and salary commensurate with ability and experience. Requires knowledge of S-370 concepts and facilities, plus experience in writing S-370 ANS COBOL. Assignments involve programming marketing, accounting, distribution and manufacturing systems in COBOL using OS-MVT in a teleprocessing environment. Company-paid relocation expenses. Please submit resume or call:

Personnel Manager
Celanese Piping Systems, Inc.
P.O. Box 1032
Louisville, Kentucky 40202
Phone (502) 775-6431 Ext. 274
An Equal Opportunity Employer

**SR. SYSTEMS ANALYSTS
APPLICATIONS PROGRAMMERS**

for Management Information Systems

Our Management Information Systems activities are expanding at a rapid rate... and we're on a talent search! Interesting assignments with a strong, viable company working within its Management Information Systems Department. EDP with two 370/158 computers under OS/MVT environment. Operations include data collection and real-time systems using IMS-V2 to access information data bases.

Our Connecticut location offers an abundance of recreational facilities, great housing and excellent schools. Immediate openings for:

**SENIOR SYSTEMS ANALYST FOR
MANUFACTURING/OPERATIONS AREA**

**PROGRAMMERS-
MUST BE EXPERIENCED IN COBOL**

TO INTERVIEW, please forward your resume, stating present salary, to Mr. S.A. Bilanchone, Professional Placement, Hamilton Standard, Windsor Locks, CT 06096.

An Equal Opportunity Employer m/f

Hamilton Standard

U
A.
DIVISION OF UNITED AIRCRAFT CORPORATION

**Marketing Manager—
Mid-Western Region**

Software Products

IF YOU SCORE ON THIS TEST
YOU'RE THE MAN WE'RE LOOKING FOR!

	YES	NO
1 Have proven track record selling software products?	<input type="checkbox"/>	<input type="checkbox"/>
2 Are Chicago based?	<input type="checkbox"/>	<input type="checkbox"/>
3 Are sensitive to the needs of user management and aware of the tremendous demand in data processing and engineering for better project management and cost control?	<input type="checkbox"/>	<input type="checkbox"/>
4 Want substantial compensation (+ expenses, fringes of course) for selling the widely successful project management and cost control system Project Control/70?	<input type="checkbox"/>	<input type="checkbox"/>
5 Are a self-starter, self-manager, intelligent, honest, a good listener, creative, and ambitious? (No, you don't have to be a boy scout too!)	<input type="checkbox"/>	<input type="checkbox"/>

If you answered all questions 'YES' and you want more facts, send resume to:

BOB WOLK

**Atlantic Software Inc.**

Lafayette Building, 5th & Chestnut Sts.
Philadelphia, Pa. 19106 • 215-922-7500

Customer Service Engineers

I have openings for over (100) "C.E." These positions are available in the major cities throughout the U.S. and Canada. Customer Engineers with experience on small or large scale computers, peripheral equipment, etc. You'll need a minimum of (2) years of experience.

Jr. CEto\$1100 mt.
CEto \$1300 mt.
Sr. CEto \$1500 mt.
Tech Spec.to\$Plus mt.
Field Mgrs.Sal Neg. mt.
Systems Analyst ..to \$1500 mt.
SalesmenSal. Plus

**AND ASSOCIATES**

5724 W. Diversey Av.
Chicago, Ill. 60639
(312) 622-7711



SYSTEMS ANALYST

Develop comprehensive management information system for Community Mental Health program in San Francisco Bay area. Prior experience: 3rd generation computer systems and MIS design and implementation essential, health systems desirable. Immediate opening, full time, 2 year contract \$21,000 and \$22,000 respectively. Personal interview required.

Contact: Gary M. Heymann, Ph.D.
Program Evaluation & Research
Mental Health Services Division
220 W. 20th Ave.
San Mateo, Calif. 94403
(415) 573-2540

"Sales Manager Wanted"

Aggressive, self-starter to head disk pack sales department. Related knowledge and experience in development and sales to dealers preferred.

CW Box 4109
797 Washington St.
Newton, Mass. 02160

Systems Programmer

Immediate opening for a software support person with a minimum of three years experience in a large OS/MVT installation. Familiarity with virtual systems and generalized timesharing services in a university environment is desirable. The position entails development and support assignments for basic systems software on our newly acquired 360/67. Should include salary history. Please write to:

Director of Personnel
Rensselaer Polytechnic Institute
Troy, New York 12181
An Equal Opportunity Employer

**CONFIDENTIAL BOX SERVICE
FOR ADVERTISERS** who do not wish their names or addresses to appear in their ads, *Computerworld* offers a confidential box service. To take advantage of this service, simply state in your initial order that you would like a "blind" ad. *Computerworld* will then assign you. ad a box number and forward all replies. The cost for this extra service is only \$1 per ad per insertion, no matter how many replies are received.

FOR RESPONDEES who hesitate to reply to a "blind" ad because there are certain individuals or firms to whom you do not want to reply, *Computerworld* offers a screening service at no cost. Simply address your reply to the box number specified, attach a separate list of such names, and put both in another envelope addressed to: Confidential Box Service, Computerworld Advertising Dept., 797 Washington St., Newton, Mass. 02160.

APPLICATIONS PROGRAMMER

Oberlin College is seeking applicants for the position of Application Programmer to: act as technical liaison and resource person for students and faculty using the Computing Center which will be operating a large digital computer using several programming languages and with heavy emphasis on time sharing; develop new or enhance existing computer programs to support classroom and research activities of students and faculty. The opportunity to teach on a part-time basis may be available. Qualifications: B.A., or equivalent, plus one year of relevant experience. Advanced degree, or equivalent, preferred with more than one year of relevant experience. Familiarity with applied statistic and numerical analysis is required. While the emphasis will be in social and behavioral science, applicants with experience in the natural sciences will be considered. Resumes should be sent by July 15, 1974 to Don Mittleman, Computing Center, Oberlin College, Oberlin, Ohio 44074. The position is to be filled by September 1, 1974 at an annual salary range of \$12,000. to \$15,000., depending on experience and qualifications. *Affirmative Action/Equal Opportunity Employer.*

**ATTRACTIVE
ROCKY MOUNTAIN
LOCATION**

Major division of a one-billion-dollar corporation requires SENIOR SYSTEMS PROGRAMMER. Minimum of five-years experience with OS/360 at system programming level necessary; also, knowledge of internals of VS/2, TSO, and HASP. Must have proven ability to creatively solve problems in the systems programming area. Send resume and salary history to:

CW Box 4111
797 Washington St.
Newton, Mass. 02160

**PROGRAMMER
ANALYST**

Coors Container Co., located 15 miles west of Denver, Colorado at the foot of the Rockies is looking for a qualified individual to design, program and document DP systems related to industrial and business applications.

Requirements: College degree in a related discipline. Minimum of 2-3 years experience doing analytical work on a 370-145 using PL1 with BAL.

Investigate this job opportunity with excellent fringe benefits including paid life/health insurance. Send resumes to:

Technical Employment Representative
Coors Industries Employment Center
1221 Ford St., Golden, Colo. 80401
An Equal Opportunity Employer



Buy Sell Swap

SYSTEMS 70
INCORPORATED
DATA
PROCESSING
EQUIPMENT
SPECIALISTS

2200 E. Devon Avenue
Des Plaines, Ill. 60018
(312) 827-8135

360/370

SYSTEMS 70
INCORPORATED
DATA
PROCESSING
EQUIPMENT
SPECIALISTS

BUY SELL SWAP

FOR SALE
CRT's

IBM 2260's — \$300 each
2848 controllers available
at similar savings

DATA OPTIONS
CORPORATION

Station Plaza
Hartsdale, N.Y. 10530
Tel: (914) 723-3800

Member:
Computer Dealers Association

BUY SELL SWAP

BUY • SELL
RECONDITION

New or Used
**TELETYPE®
MACHINES
&
DATA COM
EQUIPMENT**

call or write:
(214) 252-7502
TWX 910-860-5761



vardon
& associates, inc.
930 N. Beltline, Suite 140
Irving, Texas 75061

BUY SELL SWAP

Wanted by User for
Immediate Purchase
or Lease

All or Part
360/30 128K

2821, 2540, 2841, 2803-1,
2401-1 (3 each), Calcomp CD-1
(2 each)

FOR SALE

360/25 16K with 360/20 mode

Rapid Data Inc.
207 West Redlands Blvd.
Redlands, CA 92373
(714) 793-2855

BUY SELL SWAP

FOR SALE
AVAILABLE AUGUST
IBM

1403N1, 2821 Model II
1231N1, 1827 w/1828
1851, (TWO) 1856

Bids by June 15

Contact Mr. Gorbisky
Business Officer
RESEARCH CENTER
Rockland State Hospital
Orangeburg, New York
(914) 359-1050

BUY SELL SWAP

WANTED

TELETYPE® EQUIPMENT

New • Used • Parts

— ALSO —

- Data Terminals • Peripherals
- Mini-Computers • Modems

Contact us for data terminal sales,
service, supplies and rentals.



11300 Hartland St.
N. Hollywood, Calif. 91605
213-769-6772 TWX 910-499-2675

360/370
BUY-SELL-LEASE

Call or Write:

George S. McLaughlin
Associates, Inc.

480 Morris Avenue
Summit, N.J. 07901
(201) 273-5700

Member Computer
Dealers Association

FOR SALE
BY OWNER

UNIVAC 9300

16K Memory
132 Print POS

4 Tapes

Card Reader

Card Punch

Share Computer Cost, Inc.

(713) 526-2784

360/65

FOR SALE

- 512K IBM Core
- 3 Channels
- Multiplexer channel
- 7070 compatibility
- Attachment for 2361
- Printer keyboard 1052-7
- First user machine

Available early July '74
Asking \$375,000
Write CW Box 4112
797 Washington St.
Newton, Mass. 02160

FOR SALE
BY OWNER

IBM EQUIPMENT

1 — 514 w/mark sensing

1 — 602-1

1 — 1620-1

1 — 1622-1

2 — 1626-1

Contact: Donald Nichols
Resistance Welder Corp.
2105 S. Euclid Avenue
Bay City, Michigan 48706
(517) 684-4030 Ext. 31

ATTENTION
BURROUGHS
USERS!

We will buy your L or TC
units at today's high
prices and allow you full
use until replaced by new
equipment. Call for full
details:

Stuart Rubenstein
I.O.A. DATA CORP.
383 Lafayette St.
NYC 10003
(212) 673-9300

Member Computer Dealers Assoc.

Current Inventory
SALE

All this Unit Record
Equipment in stock and
ready to ship at money sav-
ing sale or lease prices.

RARELY OFFERED

046, 047, 029, 059, 407,
A3, 548, 557, 087, 088

MARK SENSE 519

OTHER FINE MODELS

024, 026, 056, 077, 085,

402, 403, 407, 514, 519,

523, 552, 602, 604, 521, 826

Member

Computer Dealers Assoc.

... D.P. Equipment

... Marketing Corp.

260 W. Broadway, N.Y. N.Y.

(212) 925-7737 Ext. 1

CROSS buys, sells and leases all



360/20, 30, 40, 50 and 65's
370/135's, 145's and 155's

SYSTEM/3

UNIT RECORD
EQUIPMENT

ALL PERIPHERAL
DEVICES

LEASE FINANCING AVAILABLE
(516) 487-9812



MEMBER COMPUTER DEALERS ASSOCIATION

BUY SELL SWAP

BUY SELL SWAP

FOR SALE OR LEASE

024-\$350; 026-\$1300; 056-\$250;
077-\$550; 082-\$900; 083-\$2300;
085-\$1500; 088-\$3300; 402-\$1300;
403-\$1400; 407-\$3000; 514-\$900;
519-\$1500; 548-\$2000; 552-\$1400;
557-\$3700; 602-\$400;
2311 (1)-\$3300; 729 (4)-\$2000;
729 (5)-\$2500; 729 (6)-\$2000;

1401 System-\$14,000

Member

Computer Dealers Association

THOMAS COMPUTER CORP.

600 North McClurg Court

Chicago, Illinois 60611

(312) 944-1401

SELL OR LEASE

RCA 70/590-8

Disk System



7670 Chippewa Road

Brecksville, Ohio 44141

(216) 526-2080

A Division of D&D Financial Enterprises, Inc.

THE
EXCLUSIVE

NCR

DEALER

Century 100's, 200's, 315's, RMC's,
500's peripherals and Bookkeeping
Machines.

BUY - SELL - LEASE

Business Equipment Trading Co.

2188 S. Atlantic
Los Angeles, CA
(213) 263-5157

New! **1401 SIMULATOR**
"SIM14"™
NOW AVAILABLE FOR 360-50-65
USERS

- EXECUTES UNDER BOTH DOS & OS
- SUPPORTS 1401 UNIT RECORD, TAPE AND DISC DEVICES
- JCL AND FILE COMPATIBLE WITH CS30-40
- SELF RELOCATING FOR MULTIPLE PARTITION EXECUTION
- THRUPUT SPEEDS EQUAL TO CS40
- PROVEN PRODUCT BY CUSTOMER USE
- TAKE ADVANTAGE OF 360-50-65 LEASE PRICES WITHOUT HAVING TO REPROGRAM ANY 1401 PROGRAMS

Call or Write:

DEARBORN COMPUTER LEASING CORPORATION
Subsidiary of Dearborn-Storm Corporation

4849 No. SCOTT, SCHILLER PARK, ILLINOIS 60176

312 671-4410

360-370
marketplace

BUY • SELL • LEASE



**COMPUTER
INDUSTRIES**
INCORPORATED

BRANCH OFFICE:
222 E. Wisconsin Ave.
Lake Forest, Ill. 60045
(312) 295-2030

BRANCH OFFICE:
3031 Tisch Way
Executive Suite 13
San Jose, Calif. 95128
(408) 249-0110

3570 AMERICAN DRIVE • ATLANTA, GEORGIA 30341 • 404/451-1895



ECONOMICAL

VERSATILE
EXPERIENCED

RESPECTED

GENUINE

RESPONSIVE

EFFICIENT

ENERGETIC

NEGOTIABLE

EVERGREEN COMPUTER

AND FINANCIAL, INC.

CORPORATE OFFICE:

9100 BLOOMINGTON FWY WEST

BLOOMINGTON, MN 55431

BRANCH OFFICES:

2720 DES PLAINES AVENUE

DES PLAINES, ILL 60018

525 UNIVERSITY AVENUE

PALO ALTO, CALIF 93401

"MEMBER, COMPUTER
DEALERS ASSOCIATION"

WE'VE
TOLD
YOU
OUR
ABILITIES.
YOU
TELL
US
YOUR
NEEDS.
BUY,
SELL,
LEASE
ANY
COMPUTER.

FOR SALE

2314 Disk Packs (36)

2314 Disk Cabinet

(1 year old)

Call or Write:

Agfa — Gevaert Inc.

275 North Street

Teterboro, N.J. 07608

(201) 288-4100

**Sell!
Sell!
Buy!**

Buyers meet
sellers in
Computerworld
Classifieds.

360 • BUY • 370
• SELL •
• TRADE •
• LEASE/SUBLEASE •

From Inventory

• CDC DISK •

4 Controllers
17 Spindles

• 1442-N1 •

• 2415-1 •

SPECIAL — SPECIAL

- 256K 40 Loaded
- 4 — 90KB Tapes
- 4 — CDC Disks
- High Speed I/O Set
- Call For Quote —

LUNCEFORD & ASSOCIATES

Valley View Bank Bldg.

Overland Park, Kan. 66212

(913) 381-7272

Member Computer Dealers Assoc.

BUY SELL SWAP		BUY SELL SWAP		BUY SELL SWAP		BUY SELL SWAP		BUY SELL SWAP																											
IBM UNIT RECORD EQUIPMENT <table border="1"> <tr><td>024</td><td>083</td><td>402</td><td>523</td></tr> <tr><td>026</td><td>084</td><td>403</td><td>548</td></tr> <tr><td>029</td><td>085</td><td>407</td><td>552</td></tr> <tr><td>056</td><td>087</td><td>408</td><td>557</td></tr> <tr><td>077</td><td>088</td><td>514</td><td>602</td></tr> <tr><td>082</td><td>089</td><td>519</td><td>604</td></tr> </table>				024	083	402	523	026	084	403	548	029	085	407	552	056	087	408	557	077	088	514	602	082	089	519	604	IBM COMPUTER We Buy, Sell or Lease 360 - 20 System 3 1130		BUY SELL LEASE All model 360/20's, 360/30's, 40's, 50's, and 65's. 370's and System 3's. All peripherals and unit record equipment. IBM 1401 SYSTEMS				SALE OR LEASE 360 Systems, 1401 Systems 2400 Tape Drives, 2311 Disk Drives 1620 Systems, 029, 206, 059 All Types Unit Record Equip. Incl. 082, 083, 402, 407, 514, 519, 557 SPECIAL SALE 360 (30) Sys. 1620 Disk Sys. 1401-8K I/O Set 1443 Printer 729-Tapes 2311 Disk Drives • DPA with offices in most major cities now offers IBM equipment completely reconditioned prior to shipment. • Member Computer Lessors Assn. • Call or Write DPA Inc. 2636 Farrington St., Dallas, Texas 75107 (214) 637-0950	
024	083	402	523																																
026	084	403	548																																
029	085	407	552																																
056	087	408	557																																
077	088	514	602																																
082	089	519	604																																
Big Savings — up to 50% on Short Term Rentals Call us for all your needs, we buy, rent and sell all types of IBM unit record equipment. Over 12 years of serving commercial and government requirements. All equipment rebuilt at our own factory and guaranteed for IBM MAINTENANCE . Contact: John Fennell V.P. for proposal. 212-689-4747 Cable: Leasatron, New York Telex: 423857 LMC U1 116 East 27th Street New York, New York 10016 LMC Data, Inc.				 DATA AUTOMATION CO., INC. 4858 CASH ROAD DALLAS, TEXAS 75247 (214) 637-6570 Member Computer Dealers Assoc		WHEN BUYING OR SELLING GO GREYHOUND FOR SALE 360/30's, 360/40 CORE and 2314's Special System 3 Model 10 And 2860 Model 3 GREYHOUND COMPUTER CORP. Home Office: Director of Equipment Sales, Greyhound Tower, Phoenix, Arizona 85077 (602) 248-5978 Dallas Office: M. Wm. (Bill) Tucker, Jr., Equipment Sales Manager, 7540 LBJ Freeway, Dallas, Texas 75240 (214) 233-1818																													
BUY • SELL • LEASE IBM 360/370 360/65, 512K IBM core, 2880-equivalent block multiplexor channel, eight 3330-type OEM discs, two selector channels, multiplexor channel, I/O set, six 120KB, 1600-BPI tapes and controller available at \$19,750 per month on long-term lease. Other configurations to your specifications. 370/155JI, 4 block multiplexor, 2 byte multiplexor, many other features. May delivery.  IPS COMPUTER MARKETING CORP. 467 Sylvan Avenue, Englewood Cliffs, New Jersey 07632 (201) 871-4200, TWX (710) 991-9677 "MEMBER COMPUTER DEALERS ASSOCIATION"				FOR SALE • 2365-2 • 3803-1, 3420-7's • 2030FO, 2030EO, 2030D2 • I/O Set • 370/145 Core (IBM) SYSTEMS MARKETING, INC. 100 W. Clarendon 15th Floor Phoenix, Ariz. 85013		FORSYTHE McARTHUR ASSOCIATES, INC. FOR SALE IBM 3330/1-2 spindles IBM 3333/1-2 spindles & control IBM 3830/2-disk control IBM 3830/1-disk control IBM 2314/A1-5 spindle disk system IBM 360/40-128K Processor IBM 360/44-128K Processor IBM 360/50-3rd selector chnl only • 919 North Michigan Avenue • Chicago, Illinois 60611 • Telephone: (312) 943-3770 • Telex 255161 (CAPMARKCO • CGO) Member, Computer Dealers Association																													
FOR SALE OR LEASE REASONABLY PRICED UNIVAC 1108/65K CORE AVAILABLE WITH OR WITHOUT PERIPHERALS, INCLUDING VIII C TAPE DRIVES, 432 DRUMS, PRINTER, AND NECESSARY CONTROLLERS. CW Box 3997 797 Washington Street Newton, Mass. 02160				FOR SALE OR LEASE IBM 1401 SYSTEMS with or without Tape Drives & Disks Savings in thousands Member Computer Dealers Assoc. D.P. Equipment Marketing Corp. 260 W. Broadway, N.Y. N.Y. CALL (212) 925-7737 Ext. 1		SYSTEM 360/370 dearborn computer leasing corporation A business relationship you can't afford to be without... • Lease Terms to Fit Your Needs • Field Engineering Support • Systems Engineering Support • Well Trained Marketing Staff • Buy and Sell-360s • Subleasing • Member, Computer Lessors Association Dearborn Computer Leasing Corporation a subsidiary of Dearborn-Storm 4849 North Scott Street / Schiller Park, Illinois 60176 Area 312 / 671-4410																													
BUY-SELL-LEASE 360/20 360 30/40/50 65 370 145/155  ECONOCOM Subsidiary of Cook Industries Inc. 855 Ridge Lake Blvd. P.O. Box 171116 Memphis, Tennessee 38117 (901) 767-9130 "MEMBER COMPUTER DEALERS ASSOCIATION"				360 Model 30 AVAILABLE FOR IMMEDIATE LEASE Any core size, CPU only or complete system including I/O set For an immediate quote call Sid Whiting Director of Computer Marketing (617) 266-4950 Bankers Leasing Corporation 1255 Boylston Street Boston, Mass. 02215 Subsidiary of Southern Pacific Company		CONTROL DATA CDC 3300 MASTER SYSTEM Ideal for Educational Institutions — Hospitals — Scientific environments — with Business Data Processing. CDC Peripherals Additional Memory Short term lease or sale on extremely Attractive Terms. Guaranteed Trade In or Upgrade to IBM 370 System... Computer Systems of America, Inc. 141 Milk Street, Boston, Mass. 02109 (617) 482-4671																													
360/20 Disk and/or Tape Systems D2, 1403-2, 2560 Immediate Delivery 360/20 Specialists CMI Corporation 16225 E. Warren Ave. Detroit, Michigan 48224 (313) 889-0440 Member Computer Dealers Association				FOR SALE One 2701-1 serial #11102 with two 2400 bps Terminal Adapters and associated features 3815 and 3855. Two 1826 Data Adapter Units, with digital output adapters and controls. (22 lines). Six 1851 Multiplexer Terminals, four relay multiplexers (5252) per terminal. Two of the 1851's have amplifiers (3246). Immediate Delivery Eligible for IBM maintenance tbi TBI Equipment Div. Time Brokers, Inc. 500 Executive Blvd. Elmsford, N.Y. 10523 (914) 592-4065 Nationwide broker/dealers of DP equipment & computer time Boston, Chicago, Elmsford, N.Y., Los Angeles, New York City, Washington, D.C. and San Francisco Member Computer Dealers Association		buy lease 360/370 sell trade SYSTEM/3 MODEL 10 5410-A17 49K Central Processor plus 16K of Fabri-Tek Memory Serial Number 17369 • 2074 Bysnch Adapter • 3500 Dual Program • 3601 EIA Local Attach. • 3901 1st 5445 Attach. • 3902 2nd 5445 Attach. • 4501 High Perf. Disk Attach. Including 5471 Printer Keyboard • 4110 Keyboard Attach. • 4130 1442 Attach. • 4140 1403 Attach. • 5732 Proc. Unit Exp. • 5733 Expansion B Call Collect. 612-546-4422 dataserv equipment inc. 400 shelard plaza o suite 415 minneapolis, mn 55426 Member, Computer Dealers Assoc.																													

BUY SELL SWAP

BUY SELL SWAP

BUY SELL SWAP

BUY SELL SWAP

BUY SELL SWAP

Before You Buy — Lease
Sell — 360, 370, 1401
IBM Unit Record Equip.
Please Call or Write
**COMPUTER CLEARING
CORPORATION**

5025 N. Central Expressway
Suite 3046 Dallas, Texas 75205
Telephone (214) 528-5087
18 Years Experience, and—
"We guarantee delivery at a fair
market price."
George Jachimiec, President

Lease Buy Sell
DEAL WITH PROFESSIONALS
IN PLACEMENT OF
PRE-OWNED
EQUIPMENT

360/370

"The Nations Largest Wholesale
Dealer"

**COMPUTER
WHOLESALE CORP.**
Suite 441-447
National Bank of Commerce
New Orleans, La. 70112
(504) 581-7741

FOR SALE OR LEASE
IBM 1410
COMPLETE TAPE
AND
DISK SYSTEM
BARGAIN PRICED
Member
Computer Dealers Assoc.

... D.P. Equipment
... Marketing Corp.
260 W. Broadway, N.Y. N.Y.
CALL (212) 925-7737 Ext. 1

FOR SALE
Immediate Delivery
DEC

PDP 8L's 4K Memory
PDP 8M's 4K Memory
Phone 301-296-0094
Donald E. Grempler
Realty Inc.



**SPECIALISTS
IN
370 CORE
3360/003
3360/005**

**BUY • SELL
TRADE
• LEASE
ANY EDP
EQUIPMENT**

Leasing
Dynamics Inc.
3101 Euclid Ave.
Cleveland, Ohio
216-687-0100

**we buy
and sell**

IBM Unit Record Machines
IBM 735 I/O Terminals
NCR 31 - 32 - 33 - 395 - 400,
NCR 480 - 481 - 482 - 450
BURROUGHS - L - SERIES

marion 84 Kennedy St.
Hackensack, N.J.
07601
(201) 343-4554

1600 Broadway
New York, New York 10019
(212) 541-6340

029 **Buy-Sell** 026
LEASE
IBM 360/20 026
SIMPLICITY COMPUTER

**don't
LEASE!**

UNTIL YOU FIND OUT WHY
LEASING FROM THE
FULL-SERVICE COMPANY
IS DIFFERENT....

AVAILABLE IMMEDIATELY.
360/40H WITH I/O SET
360/501 WITH I/O SET
UNIVAC 1004

CALL STEVE ELIAS AT (213) 678-0311
OR WRITE TO

CSC
COMPUTER SCIENCES CORPORATION
650 N. SEPULVEDA BLVD
LOS ANGELES, CALIFORNIA 90045
Major Offices and Facilities Throughout the World

360 Model 40
AVAILABLE FOR
IMMEDIATE LEASE

Any core size, CPU only or
complete system including I/O set
For an immediate quote call

Sid Whiting
Director of Computer Marketing
(617) 266-4950

Bankers Leasing Corporation
1255 Boylston Street
Boston, Mass. 02215
Subsidiary of Southern
Pacific Company

'SUPER DEAL'
370/155- 1 MEG-IBM
Three Year
Lease/Purchase Option

with Dat Box \$21,000.00/mo
without Dat Box \$18,000.00/mo

call: Daniel Geelan
(212) 867-4947
Yale Industries Corp.
299 Madison Ave.
N.Y. 10017



FOR SALE OR LEASE

65K 1.5 u
Model 30 System
Complete with
I/O Set
and 5/2311's

8K Model 20
W/2203 and 2560

8K & 12K 1440
Disk Systems

7335 Tape Drive

Member Computer Dealers Assoc.

ACS Equipment Corporation
8928 Spring Branch Drive
Houston, Tx 77055
(713) 461 1333

FOR SALE

IOMEC 2012 Disk Drive
System, Incl. Power Supply,
Controller with Interface to
Micro 800 or Cincinnati Mila-
cron CIP/2000 Mini-
computer, and 4 Disk Car-
tridges.

(used Unit, but Recondi-
tioned by Factory to be Like-
New)

\$3500

**TRANSACTION
DATA SYSTEMS**

P.O. Box 80157
San Diego, Ca. 92138
(714) 453-5303

1401

Several Systems Available
With or Without Tape Drives

CMI Corporation
16225 E. Wareen Ave.
Detroit, Michigan 48224
(313) 889-0440
Member Computer
Dealers Association

**FOR SALE
OR LEASE**

IBM 2821-1 and 2540-1
IBM 729 Magnetic Tape Units
Models II, IV, V and VI
IBM 1401 Systems Con-
figured to your requirements
THE HALSEY CORPORATION
1367 Central Avenue
Middletown, Ohio 45042
(513) 424-1697
Member
Computer Dealers Association

**WE WANT
TO BUY**

1-Used Burster
2-Used Data Safe

with minimum
2-hour rating
CALL MR. ASCHENBRENNER
(301) 944-8811

360/30 3-DISK
SYSTEM WITH 600 LPM
I/O SET FOR ONLY
\$99,000!

Here's a full 32K, 2us system,
including three 2311's and con-
trol unit, 1403-2 printer, 2821-1
and 2540, plus 1051/1052 for
only \$99,000!

CPU features: Storage Protect, In-
terval Timer, Floating Point, Deci-
mal Arithmetic, 1051 Attach-
ment; Serial #10977; 16K IBM
and 16K OEM core; currently under
IBM maintenance.
Delivery: July



TBI Equipment Div.
Time Brokers, Inc.
500 Executive Blvd.
Elmsford, N.Y. 10523
(914) 592-4065

Nationwide broker/dealers of
DP equipment & computer time.
Boston Chicago, Elmsford, N.Y., Los Angeles
New York City Washington, D.C. and San Francisco
Member Computer Dealers Association

NOTICE NOTICE NOTICE
The State of California anticipates
releasing invitations for bids for
replacement of a major portion of
its IBM 370 peripheral devices.
Such devices include disks — IBM
3330 type; video-IBM 3270 and
2260 types; typewriter termi-
nals — IBM 2741 type; tapes —
IBM 3420 type; front-end proces-
sors — IBM 3705 and 3704 types;
printers — IBM 3211 type. These
procurements will be subject to
competitive bidding.

**THIS AD IS NOT A
SOLICITATION FOR BIDS**
The purpose of this notice is to
solicit the names of those firms
interested in receiving invitations
For Bid. The state of California
maintains a central vendors' list
for EDP equipment in the Depart-
ment of Finance, EDP Control &
Development Division. All firms
seeking to be considered or wish-
ing to receive invitations for bid
for the above noted peripherals
replacement procurements should
forward a letter indicating such
interest to

Department of Finance
EDP Control & Development
1025 P Street, Room 498
Sacramento, Calif. 95814
Attn: Philip E. Mishler

The procurements will be held
over the next 18 months by the
following departments: Employ-
ment Development Department,
Franchise Tax Board, and
Stephen P. Teale Consolidated
Data Center. The award dates and
release dates of IFB's vary over
the next 18 months. Separate pro-
curements will be conducted by
each agency.

Shop the
CLC computer
supermarket
SALE...LEASE...PURCHASE...TRADE

THIS WEEK'S SPECIAL:
CDC 6600
Complete systems with all peripherals

Call your
nearest
CLC office:

Washington (703) 521-2900
Pittsburgh (412) 921-3077
Atlanta (404) 393-1309
Chicago (312) 298-0888

St. Louis (314) 878-4741
Kansas City (816) 471-7376
Houston (713) 447-0325

Dallas (214) 637-5010
Los Angeles (714) 645-3712
San Francisco (415) 928-7202
Portland (503) 297-4721

**CLC Computer Leasing
COMPANY**

Hq: 2001 Jefferson Davis Highway, Arlington, Va. 22202
Member: Computer Lessors Association

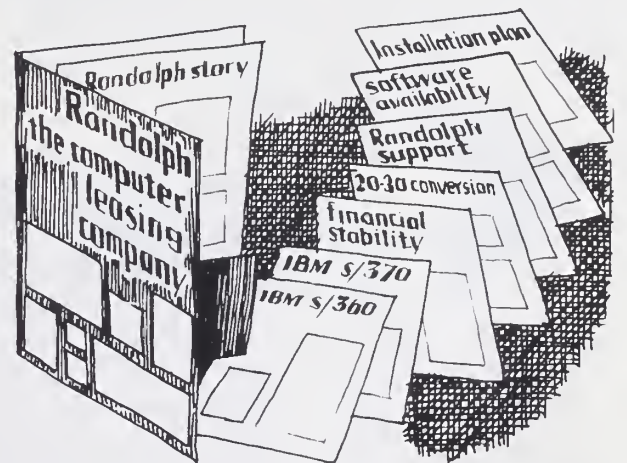
BUY...SELL...LEASE
IBM 360/370



**THE
COMPUTER
EXCHANGE
INC.**
Member, Computer
Dealers Association

In the West: 235 Montgomery
Street, San Francisco, CA
94104, (415) 788-0600. In the
East: 11 Grace Ave., Great
Neck, N.Y. 11021, (516)
466-6500.

**Computer leasing
by the book.**



To find out more about Randolph's approach to computer
leasing and customer support services, call or write
your nearest Randolph office for our new four-color
brochure, *Randolph... the computer leasing company.*

Northeast:
537 Steamboat Road
Greenwich, CT 06830
(203) 661-4200
(212) 931-1177

Box 1963
100 Federal Street
Boston, MA 02105
(617) 434-4043
621 Country Club Road
Avon, CT 06001
(203) 673-0435
20 Cornell Place
Englishtown, NJ 07726
(201) 446-6300

Mideast:
6110 Executive Blvd.
Rockville, MD 20852
(301) 770-6266

Southeast:
260 Peachtree St. NW
Atlanta, GA 30303
(404) 688-6932

Midwest:
8050 Hosbrook Rd.
Cincinnati, OH 45236
(513) 793-6060
625 North Michigan Ave.
Chicago, IL 60611
(312) 787-4224

Southwest:
1545 W. Mockingbird Lane
Dallas, TX 75235
(214) 637-3680

6440 Hillcroft, Suite 108
Houston, TX 77036
(713) 666-9464

West:
One Wilshire Blvd.
Los Angeles, CA 90017
(213) 680-9195
525 University Ave.
Palo Alto, CA 94301
(415) 327-2780
530 "B" Street
San Diego, CA 92101
(714) 232-6401



RANDOLPH COMPUTER COMPANY
Division of Firstbank Financial Corporation
A subsidiary of the First National Bank of Boston

BUY SELL SWAP		BUY SELL SWAP		BUY SELL SWAP		BUY SELL SWAP		TIME FOR SALE	
BUY SELL LEASE TRADE 360/30 Special Immediate delivery on any configuration 1.5 or 2.0 MIC, 32K to 96K Wanted to Purchase 370/135 370/145 COMDISCO 2200 E. Devon Ave., Des Plaines, Ill. 60018 • Ph. 312-297-3640 • TWX 910-233-2470				FOR SALE System Industries Disk System Controller, power pack, double Diablo disks — one fixed and one removable. Includes upright cabinet and 2 extra disk packs. Little use, 2.5 million words — interfaced to Nova/\$7500 (214) 350-7749 — Dallas		FOR SUB-LEASE MEMORY FOR 360/65 SPECS 512K FABRI-TEK TERM 1 Yr Lease 3500 dollars/mo. Will discuss arrangements to trade it in on other memory for 360/50's or 370/135S, 145S, 155S, 165's, CALL (515) 284-2679		Wanted to Purchase Flexowriters 2201, 2301 2302, 2303 7102 SFD, SPD, SPS Add Punches AP5, AP6 ABR Corp. 262 Mott St., NYC 10012 (212) 431-7820	
We Need: 360/40-256K 2821 MOD 1 32K-2 MIC CORE Available: COMPLETE BANKING SYSTEM 1401 System 8K or 16K 4 Tapes 1403 Printer 1412 reader/sorter 1402 Card r/p Installed Price: \$30,000 Immediate Delivery cac COMPUTER ACQUISITIONS COMPANY P.O. Box 80572 Atlanta, Ga. 30341 (404) 458-4425				THE HALSEY CORPORATION 1367 Central Avenue Middletown, Ohio 45042 (513) 424-1697 <i>Member</i> <i>Computer Dealers Association</i>		FOR SALE OR LEASE D.E.C. PDP 11/45 and PDP 1105 and peripheral hardware including 8 CRT units. Used six months fully maintained For information call Mr. L.E. Sogoloff Federal-Rice Drug Co. Pittsburgh, Pa. (412) 471-3124		FOR SALE 2321 DATA CELL 2841 CONTROL UNIT WITH 10 EXTRA CELLS IBM MAINTENANCE —AVAILABLE IMMEDIATELY— Submit sealed bid to: BOARD OF EDUCATION MEMPHIS CITY SCHOOLS 2597 AVERY AVENUE MEMPHIS, TENNESSEE 38112 ATTN: PURCHASING DEPT. Opening will be June 20 @ 11:00 AM. Mark envelope: "Data Cell, June 20 @ 11" For more information call JAMES BASKIN (901) 324-7949	
FOR SALE 1. 2314 SERIAL #18302, Model AO1 208 Volts, 2 channel switch 2. 2313 SERIAL #23445, Model AO1, with drive identifier Lens B through E, second and third position designators, 208 Volts 3. 2312 SERIAL #16166, Model AO1, drive identifier Lens A, first position designator, 208 Volts 4. 2312 SERIAL #13727, Model AO1 with drive identifier Lens F, 208 Volts ALL OF ABOVE ITEMS CERTIFIED FOR IBM MAINTENANCE AND AVAILABLE JUNE 15, 1974 5. 2316 Twenty-one (21) Disk Packs Sealed bids for the Disk Storage System are due June 11, 1974, by 1:00 P.M. Central Standard Time. Successful bidders will be notified on June 14, 1974. The Board of Police Commissioners reserves the right to reject any and all bids. The buyer must crate and ship equipment from site. 25% down-payment is required at contract signing, balance at shipment. Bids are to be forwarded to: Board of Police Commissioners 1125 Locust Street Kansas City, Missouri 64106 Attn: Captain Gus Yendrek, Fiscal Division				FOR SALE IBM 077 MOD 1 \$275.00 IBM 514 MOD 1 \$575.00 IBM 407 M/A \$1475.00 SPECIAL LEASE OFFER • IBM 407, 077, 082, 514 = \$250/mo. • Also Available 083, 085, 088, 552, 519, 548, 602 • Call Now For Lease Quotation • Contract Maintenance Available Contact Ron Johnson or Len Wolfe (312) 695-2242 or 695-2275 Kane Accounting Service 1115 Sherwood Elgin, Ill. 60120		FOR SALE IBM 2780 Compatible Terminals Line Printers CDC, Honeywell, Mohawk, Centronics, Bright, Potter Card Readers Documentation, PDI, Burroughs Card Reader/Punch Honeywell 214A Magnetic Tape Pertec Will Sell Single Units or Entire \$750K Investment For \$150K DCS Financial Corp. 1636K East Edinger Santa Ana, Calif. 92705 (800) 854-3379 Toll Free or (714) 558-0333 Collect in Calif.		360/20 Card Systems C1, 1403-2, 2501, 2560 C3, 2203, 2560 Immediate Delivery 360/20 Specialists CMI Corporation 16225 E. Warren Ave. Detroit, Michigan 48224 (313) 889-0440 <i>Member Computer Dealers Association</i>	
FOR SALE 1. 2314 SERIAL #18302, Model AO1 208 Volts, 2 channel switch 2. 2313 SERIAL #23445, Model AO1, with drive identifier Lens B through E, second and third position designators, 208 Volts 3. 2312 SERIAL #16166, Model AO1, drive identifier Lens A, first position designator, 208 Volts 4. 2312 SERIAL #13727, Model AO1 with drive identifier Lens F, 208 Volts ALL OF ABOVE ITEMS CERTIFIED FOR IBM MAINTENANCE AND AVAILABLE JUNE 15, 1974 5. 2316 Twenty-one (21) Disk Packs Sealed bids for the Disk Storage System are due June 11, 1974, by 1:00 P.M. Central Standard Time. Successful bidders will be notified on June 14, 1974. The Board of Police Commissioners reserves the right to reject any and all bids. The buyer must crate and ship equipment from site. 25% down-payment is required at contract signing, balance at shipment. Bids are to be forwarded to: Board of Police Commissioners 1125 Locust Street Kansas City, Missouri 64106 Attn: Captain Gus Yendrek, Fiscal Division				WANT TO BUY IBM 2321 DATA CELL DRIVES IBM 3201 DATA CELL UNITS DATA CELL UNIT STORAGE RACKS Drives must be certified to have recently been under IBM maintenance — or if Drives have been off maintenance past continual maintenance time period, IBM inspection fee and other costs to bring Drives up to maintenance standards to be paid by seller. Model 3201 Data Cell Units must be unused or moderately used only. Subject to acceptance inspection. WRITE: P.O. Box 875 Cupertino, Calif. 95014		FOR SALE OR LEASE 360/30 1401 Corporate Computers, Inc. 115 Mason St. Greenwich Conn. 06830 (203) 661-1500 <i>Member</i> <i>Computer Dealers Assoc.</i>		WANTED TO LEASE OR PURCHASE 1287 MODEL 2 SCANNER with features: NOF Recognition NOF Reference Marks Numeric Handwriting Recognition Standard 1428 2671/2822 PAPER TAPE READER with Supply Feature Center Roll Feature Take-up Feature CALL OR WRITE: THOMAS STAGIS CONSOLIDATED COMPUTER CORP. 330 WEST 34TH ST. NEW YORK, N.Y. 10001 (212) 736-4220	
You can't beat our deal on a used IBM 370. Who else has the inventory to provide the exact configuration you want — when you want it? Who else will quote you a serial number along with a price? And who else pays top-dollar for your 370? With over half a billion dollars in IBM computer experience, we know the data processing market like nobody else's business. So call the Computer Sales Corporation at ITEL. Bob Gulko (415) 983-0388 Fred Hegeman at (415) 983-0410, or Dick Hynes at (415) 983-0278. ITEL CORPORATION One Embarcadero Center, San Francisco, Calif. 94111 145, 155, 3360's, 360-50, 360-65 and 2315's available . . . 135's, 145's, 155's and 165's required.				WE WANT TO BUY MINI COMPUTERS and Peripherals WE ALSO SELL THE ABOVE CALL OR WRITE FOR FREE BROCHURE NEWMAN COMPUTER EXCHANGE, INC. 3960 Varsity Drive Ann Arbor, Mich. 48104 (313) 973-1230		FOR LEASE BY OWNER IBM 360/65 1 meg. Available July 74 We currently have a 360/65 and are anxious to lease. We will pass on all benefits to lessee. Call (515) 284-2679 Terms: — 2 years with an out after 1 year Rental Negotiable		Time for Sale COLORADO 370/145 INSTALLATION WITH • 256K • 3330 Disks • (2) 1110 LPM Printers — UCS Features • 2540 Card Read Punch • (4) Tape Drives — IBM 3420 Compatible — 200KB5 • (6) 2319 Disk Drives — going out in January, 1975 ALSO INCLUDED • 13 keypunches (7 are both punch & verify) • One high-speed decolorator • One high-speed Moore burster We would like to make this computer equipment (fully maintained) and facility available to one customer on a long-term basis at a fixed monthly cost for a 10-hr. shift (9 p.m.—7 a.m.) 6 days a week. This facility is housed in a beautiful new building near Denver, Colorado, with ample space for working and storage of supplies. This would be an excellent opportunity for an organization who needs all of the equipment and facilities to operate an entire production shop. CONTACT Mr. L. Pape or Ms. M. Mosher (303) 447-1010	
TELETYPE 32's & 33's WANTED LIBERAL TRADE ALLOWANCES ON CRTs Phone (503) 227-0111				370-155 FOR SALE 3135 (I) 512K 3274 1433 1434 7855 3360 (03) 3215 (01) P.C.M. Corp. 2636 Farrington Dallas, Texas 75207 (214) 637-0950		360/20 CARD SYSTEM Sale or Lease 360/20-C1-8K Processor 1580, 8082, 8090, 8099 2203-A1 Printer 2560-A1 MFCM 1575-2 Lines of Print 2501-A1 Card Reader THOMAS COMPUTER CORPORATION 600 N. McClurg Court-3807A Chicago, Illinois 60611 (312) 944-1401		360/20 Card Systems C1, 1403-2, 2501, 2560 C3, 2203, 2560 Immediate Delivery 360/20 Specialists CMI Corporation 16225 E. Warren Ave. Detroit, Michigan 48224 (313) 889-0440 <i>Member Computer Dealers Association</i>	

TIME FOR SALE

MASSACHUSETTS

I.B.M. - 360-30

Computer Time Available

Very Attractive Rates

Also Available

Off-Line Print Time

For Further Information

Contact NEIL JOSEPH

at (617) 823-4532

COMPUTER TIME

BROOKLINE

370/135

1st and 2nd Shift

96K DOS or DOS/VS

Power 2

5-3330 1-2501

2-3420 1-1442

1-1403

\$50.00 per hour

Contact: Mr. K. Coleman

(617) 738-6410

SYSTEMATIC

DATA PROCESSING

SERVICES, INC.

IBM 370/155

DATA CENTER

Batch Computer Time

Remote Job Entry

Conversational Remote Entry

CCA 204 On-Line DBMS

Information Management System

RAMIS

Remote Terminal

at PSDI, 14 Story Street

Harvard Square, Cambridge

Call Sales Dept., 890-1200

400 Totten Pond Road

Waltham, Mass. 02154

NEW YORK

Thomas National, Inc.

1775 Broadway, N.Y.C.

370/158

DATACENTER

OS-VS - RJE

And Other Communications

Turnkey Responsibilities

DOS Emulation

3330's and 2314's

Systems and Programming

Support

Data Entry Services

Convenient 57th St. Location

Open 24 Hours Per Day

Call (212) 765-8500

370/158

2 meg. TSO, RJE

(18) 3330, (3) 2319

(20) 3420, (4) 1403

370/135

196K

(6) 3330, (3) 2319

(8) 3420, 1403

All shifts

Very attractive rates

Stu Kerievsky

Datamort

132 West 31 St.

New York, N.Y.

(212) 564-3030

NEW YORK

Kennedy Airport Area

370/135-2nd, 3d Shift from

\$45/Hr. 144 K, 4-3420 MOD

3.

6-2319

1403 N1

2501

3740

Omnicor, Division of

U.S. Industries

475 Doughty Blvd.

Inwood, L.I., N.Y. 11696

Contact: John Dougherty

(212) 471-3900

TIME FOR SALE

NEW YORK

COMPUTER TIME

370/145

4-3330 6-3420

1-3211 1-1403

1-3505 1-2540

HANDS ON AND PARTITION

TIME AVAILABLE

JUST OVER

BROOKLYN BRIDGE

Management Data Services

(212) 624-7400 Ext. 463

ASK FOR MR. BOUROS

MICHIGAN

COMPUTER TIME

AT ATTRACTIVE RATES

360/30, 3-2311, 2540, 1403

2nd & 3rd Shift and Weekends

Systems & Programming

Support Available

For Details Contact:

Larry Bager (313) 732-1260

IN-TRA-CON INC.

G-2503 S. Linden Rd.

Flint, Michigan 48504

ILLINOIS

IBM 360/370 USERS

Computer Time Available

370/158

2 meg, 3 3330 (32m), 3 2314

(24m) 12 3420-5 tape, 2

1403, 3211.

OS/VS2, RJE, IMS, TSO, DOS

emul.

24 Hours - 7 Days

CAN YOU BEAT

8.7 cent/sec for a 64K region?

370/155

2 meg, 3330 (8m), 2314 (8m),

10 3420-5 tape.

370/135

240K, 4 3330's 1 2314, 6

3420-5 Tape.

360/30

64K 5 3420-3dd Tape, 4

2311's.

For Further Information

CALL RON ELLIS

(312) 346-1331

computer research

company

200 N. Michigan

Avenue

Chicago, Ill. 60601

Largest Computer Time Sales Co.

SOFTWARE FOR SALE

MEDICAL BILLING

SYSTEM

• Complete Insurance Forms

• Profile, RVS, ICDA Files

• Bal forward, Ledger, Open Item

• All Cobol - DOS or OS

MAIL - ALL LIST/LETTERS

• Updates/Purges/Selects

• Letters/Labels

• Only \$660-30 day trial

also Payroll/Personnel

• Only \$960-30 day trial

Occidental Computer

805 S. San Fernando Rd.

Burbank, Calif. 91505

(213) 843-2722

GERMAN

SOFTWARE-HOUSE

is looking for a U.S.-part-

ner, who can deliver com-

mercial operating-sys-

tem-software, COBOL,

PL-1 and RPG II com-

pilers, sort/merge etc. for

DEC PDP-11 and 8

computer systems

to be distributed to end-

users in Europe.

INFORMATIK-INSTITUT

6078 Neu-Isenburg 2

West Germany

Postfach 2183

Tel: 0611-6604290

SOFTWARE FOR SALE

ACCOUNTING

SYSTEMS

PAYROLL

GENERAL LEDGER

ACCOUNTS PAYABLE

INVENTORY

ACCOUNTS RECEIVABLE

IBM SYSTEM/3 USERS

IBM 360-70 USERS

RPG II BAL COBOL

Certified Software Products, Inc.

3140 Harbor Lane North

Minneapolis, Minn. 55441

612-546-6919

MMS

Accounts

Receivable

Eliminates the

Long Wait.

• Database Design--

All Cobol

• Open Item or

Balance Forward

• Multi-company

• Flexible Aging

• Simplified

Cash Posting

SOFTWARE

INTERNATIONAL

Elm Square, Andover, Mass. 01810

(617) 475-5040

SOFTWARE FOR SALE

HOSPITAL

FINANCIAL SYSTEM

• Budget Modeling and Forecasting

• General Ledger

• Productivity Analysis

• Step-down Cost Allocation

• Trend Analysis

• In-Out Patient Costs

• Departmental Analysis

• Hospital Summaries

• Balance Sheet

• Flexible Budgeting

• Financial Reports by Level of

Management

Use on your terminal or buy

proprietary rights - all in ANSI

COBOL.

HSA Hospital

Financial Services, Inc.

120 East Ogden, Hinsdale, Ill. 60521

359 San Miguel

Newport Beach, Calif. 92660

(714) 644-6411

SYSEX

LOOKING FOR

SOFTWARE?

Free Software Search and

Package Appraisal Service

Our job is to help you locate the

software packages which best

meet your needs. There is no

charge to you for this service.

Write on your company letter-

head or call:

Systems Exchange Co.

1034 Colorado Ave.

Palo Alto, Calif. 94303

(415) 328-5490

SYSEX

SOFTWARE FOR SALE

MSA GENERAL

LEDGER

WHY HAVE OVER 700 CLIENTS

PURCHASED MSA SYSTEMS?

WHY HAS MSA SOLD OVER

140 GENERAL LEDGER

SYSTEMS IN THREE YEARS?

HERE'S

WHY!

• EFFICIENT REPORT WRITER

• STATISTICS MANAGEMENT

• FLEXIBLE BUDGETING

• ACCOUNT ANALYSIS

• COST ALLOCATION

• RESPONSIBILITY AND

PROFITABILITY REPORTING

• UNLIMITED NUMBER OF

REPORTING LEVELS

• PROJECT ACCOUNTING

• DIRECT, FULL ABSORPTION

OR INCREMENTAL COSTING

• CURRENCY CONVERSION

USERS BY PRODUCT

PAYROLL/PERSONNEL-245

FIXED ASSETS-150

ACCOUNTS PAYABLE-60

INVENTORY CONTROL-25

OTHER BANK SYSTEMS-80

Write or Call to Compare

William M. Graves

Management Science America

3445 Peachtree Road, N.E., Suite 1300

Atlanta, Ga. 30326

MSA

Atlanta 404-262-2376

New York 201-871-4700

Chicago 312-323-5940

Los Angeles 213-475-9726

San Francisco 415-328-1700

ACCOUNTING IV

THE FINEST

GENERAL LEDGER

AND FINANCIAL

REPORTING

SYSTEM

AVAILABLE

Featuring:

• Conventional Report Generator

• Graphic Report Generator

• Matrix Report Generator

• Responsibility Reporting

• Flexible Budgeting Module

• Multiple Currency Version

to accommodate foreign

subsidiary accounting

informatics inc

Contact: Ron Kupferman

65 Route 4

River Edge, N.J. 07661

New York (212) 564-1258

New Jersey (201) 488-2100

SOFTWARE FOR SALE

TAXBREAK

Payroll tax calculation module

Calculates payroll withholding taxes

for 50 states, federal, FICA and

cities. COBOL. \$875 complete.

Maintenance service on tax changes

available for \$225 per year.

ARGONAUT INFORMATION

SYSTEMS, INC.

2140 Shattuck Ave.

203

Berkeley, CA. 94704

(415) 845-7991

Opportunities Knock Here

Computerworld

Classifieds could hold

the key to your next

office.

SOFTWARE SALES AGENTS

Provide national sales coverage for major software package in central and western regions of the United States.

Package offers most comprehensive automated system for planning and controlling the development and maintenance of computerized information systems available today.

Over 30 installed in major Fortune 500 firms. Extensive marketing program, literature, sales training and support provided.

For immediate information
Call: Art Esch
Director of Marketing
(212) 489-7620

AUXCO

Auxton Computer Enterprises
1345 Avenue of Americas
New York, New York 10019
CLIP THE ATTACHED
COUPON AND SEND
FOR FURTHER DETAILS
TODAY

NAME
TITLE
COMPANY
ADDRESS
CITY
STATE
ZIP
TELEPHONE NO.

Earnings Results File In; Most Healthy

AMS Earnings Decline in Half

SUNNYVALE, Calif. — Although second quarter revenues were at a record high for Advanced Memory Systems, Inc., the memory maker witnessed declining earnings in the quarter and the half compared with the same periods last year.

For the six months, earnings, including a \$117,500 special credit, totaled \$244,800 or 13 cents a share compared with \$914,200 or 48 cents a share, including a \$546,300 special credit in the 1973 period.

Revenues rose, however, to \$16.4 million from \$14.6 million in the 1973 period, whose figures are restated to include results of Computer Microtechnology, Inc. prior to its acquisition a year ago.

In the second quarter, earnings dropped to \$213,800 or 11 cents a share, including a \$102,500 special credit, compared with earnings of \$365,200 or 19 cents a share, including a \$175,300 special credit, in the year-ago period.

Revenues rose to \$9.1 million from \$7.9 million.

In the first quarter, sales were up over the year ago quarter, to \$7.4 million compared with \$6.7 million, but down slightly from the two previous quarters.

Chairman Robert H.F. Lloyd attributed this to transitions in component and system product lines, some temporary material

shortages and the short month worked in December.

Earnings during this period totaled \$31,000 or 2 cents a share compared with a restated \$549,000 or 29 cents a share, of which \$371,000 was a special credit.

Intel 'Enthusiastic' After 1st Quarter

SAN FRANCISCO — While Intel Corp. completed an "outstanding" first quarter, President Peter S. Redfield said he expects "first-quarter results this year, as in prior years, to be the lowest of our four quarters, with the major portion of earnings occurring later in the year.

"We are very happy and enthusiastic about Intel's prospects for the rest of the year," he added.

In the quarter ended March 31, earnings rose to \$2.1 million or 21 cents a share from \$744,000 or 9 cents a share in the year-ago period.

Revenues reached \$29.4 million compared with \$14.9 million last year.

Figures for 1973 have been restated to reflect the discontinuance of certain businesses as well as a change in accounting for investment tax credit.

Each of the firm's operating groups, financial services, transportation services, data services and data products contributed to the first-quarter results, Redfield said.

Centronics Reports Improved Nine Months

HUDSON, N.Y. — Third-quarter and nine-month results were

up at Centronics Data Computer Corp., which introduced five new products within the past four months.

In the third quarter ended March 31, revenues reached \$11.1 million compared with \$6.9 million, while earnings rose to \$2.1 million or 43 cents a share compared with \$1.4 million or 29 cents a share in the year-ago period.

Nine-month earnings for the printer maker totaled \$5.7 million or \$1.18 a share compared with \$3.2 million or 65 cents a share in the same period last year.

The market acceptance of the new products "has been most gratifying," observed President Robert Howard.

Wang Labs Experiences 70% Earnings Increase

TEWKSBURY, Mass. — All product areas of Wang Laboratories, Inc. contributed to a 70% rise in the nine-month earnings and a 33% rise in sales over the year-ago period.

Nine-month earnings reached nearly \$3 million or 74 cents a share compared with \$1.8 million or 44 cents a share in the 1973 period.

Revenues totaled \$43.9 million compared with nearly \$33 million.

In the third quarter ended March 31, earnings totaled \$1.2 million or 29 cents a share compared with \$1 million or 26 cents a share in the year-ago period.

"All our products, including programmable calculators, our System 2200 computer, the

Model 1200 word processing systems and Wang Computer Services have contributed to this improvement. In addition, business remains strong in international markets," said President An Wang.

Incoterm Ends Year In Strong Position

NATICK, Mass. — Incoterm Corp., maker of intelligent terminals, completed its year with higher revenues and earnings and reached its strongest financial position in the firm's history, President Jean N. Tariot said.

Earnings for the year ended Feb. 23 totaled \$1.6 million or 92 cents a share compared with \$1.2 million or 85 cents a share in the 1973 period.

Revenues rose to \$16.6 million from \$11.6 million last year.

Current assets increased to \$10.6 million from \$5.3 million a year ago.

TEC Net Rises 77%; Sales Near \$4 Million

TUCSON, Ariz. — Earnings rose 77% while sales were up 31% at TEC, Inc. in the six months ended Dec. 31.

Earnings reached \$392,801 or 58 cents a share compared with \$222,301 or 33 cents a share in the year-ago period.

Revenues rose to \$3.9 million from nearly \$3 million a year ago.

The maker of CRT terminals and keyboards declared a 10 cent per share dividend payable April 15.

Toward the Bottom Line

Four Phase Systems has increased its line of credit to \$20 million through an agreement with a group of banks led by Bank of America. The line will be used to finance leased equipment and accounts receivable.

\$\$\$

Boothe Computer extended its offer to acquire all of its outstanding 5-3/4 debentures due 1988 to May 15 from April 15, when the firm said 55.9% of the debentures had been tendered. The exchange offer requires tender of 95% of the debentures to be effective, unless a lesser percentage is agreed to by the company and GAC Finance, Inc.

\$\$\$

Alpex Computer is looking for new business activities within the constraints of its financial condition, President Norman Alpert said. The firm plans to offer an exchange of debentures to relieve the financial pressures of semiannual interest payments on

its 7-1/2% debentures in the near future.

\$\$\$

Kennedy Data Systems has received a two-year loan to be used to finance development of additional floppy disk systems and related products and for expansion and marketing.

\$\$\$

Megadata Computer and Communications has improved its working capital position through

an additional line of credit with the Long Island Trust Co. In addition, Cable and Wireless Ltd. has purchased a \$200,000 seven-year convertible subordinate debenture.

\$\$\$

Name change: Penril Data Communications to Penril Corp., in order to reflect expansion of the product base resulting from the acquisition of Fairchild's Electro-Metrics division.

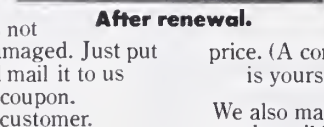
Extend your
3705
Emulator Program...
...and reduce costs.
Add these front-end capabilities:
□ SPEED SELECT □ MULTIPLE CONSOLE SUPPORT
□ CONTENTION □ CODE CONVERSION
□ SYSTEM SELECT □ 3705 ORIGINATED MESSAGES
Standard packages in use throughout the U.S.
and Canada. Call today for more information.
COMM-PRO ASSOCIATES
638 14th St. • Manhattan
Beach, Calif. 90266
(213) 376-1344

Send us a used printer ribbon and we'll renew it. Free.

We don't just re-ink used ribbons, we re-manufacture them to 90% of their original quality. To prove our point, we'll renew one used ribbon for you free of charge — as long as it's not permanently damaged. Just put it into a box and mail it to us along with this coupon. Limit: One per customer.



Before renewal.



After renewal.

You'll find that our renewed ribbons are really a great bargain since you'll not only be getting 90% of the original quality, but you'll be paying only about 50% of the original price. (A complete price list is yours for the asking.)

We also make the best new data ribbons money can buy. (We'd be delighted to send you complete details and a quotation.)

Dear Dataribbon people:

- ☐ Enclosed is a used data ribbon for you to renew at no charge.
- ☐ Send info and prices on your renewed data ribbons.
- ☐ Send info on your new data ribbons.

Name
Address
City State Zip
Mail to: Dataribbon, 18360 Oxnard Street, Tarzana, CA 91356.

D
DataProducts
Dataribbon Division

KEYPUNCHING \$3.50 PER HOUR

CARDS OR TAPE

One Week Turnaround

(Friday to following Monday)

99.5% Accuracy Guaranteed

on Verified Work

Specialists in Upper/Lower Case

Call Collect

Len Phillips (617) 491-2793

AMERICAN DATA

PREPARATION CORP.

675 Massachusetts Avenue

Cambridge, Mass. 02139

IMMEDIATE

SALE OR LEASE

IBM 360/40

CPU's/SYSTEM's

617/261-1100

AMERICAN USED
COMPUTER CORPORATION

P.O. Box 68 Kenmore Station, Boston, MA 02215
Member Computer Dealers Association

Earnings Reports

CONRAC			ENNIS BUSINESS FORMS		
Three Months Ended March 31			Year Ended Feb. 28		
	1974	1973		1974	1973
Shr Ernd	\$.57	\$.45	Shr Ernd	\$1.03	\$.58
Revenue	20,290,000	15,892,000	Revenue	49,657,133	41,611,620
Earnings	766,000	608,000	Earnings	2,443,914	1,424,123
DECISION DATA COMPUTER			3 Mo Shr		
Three Months Ended March 2			Revenue		
	1974	1973		13,098,820	10,623,222
Shr Ernd	\$.04	.....	Earnings	a565,190	385,438
Revenue	7,234,000	\$3,374,000	a-Includes a nonrecurring net charge of \$83,200 to provide for estimated losses from discontinuance of a product line.		
Tax Cred	66,000	.....		
Earnings	141,000	(396,000)			

COMPUTER AUTOMATION		
Three Months Ended March 31		
	1974	1973
aShr Ernd	\$.32	\$.16
Revenue	5,606,820	3,081,161
Tax Cred	.....	1,000
Earnings	540,258	272,020
a9 Mo Shr	.80	.54
Revenue	13,760,252	7,892,090
Tax Cred	.....	184,000
Earnings	1,338,670	849,927
a-Fully diluted.		

COMPUSCAN		
Three Months Ended Feb. 28		
	1974	1973
Shr Ernd	\$.19	\$.13
Revenue	2,102,000	1,602,000
Tax Cred	133,000	93,000
Earnings	291,000	207,000
9 Mo Shr	.44	.31
Revenue	5,532,000	4,208,000
Tax Cred	306,000	224,000
Earnings	677,000	480,000

NATIONAL CSS		
Year Ended Feb. 28		
	1974	1973
Shr Ernd	\$1.62	\$1.37
Revenue	23,700,501	16,659,057
Tax Cred	208,800	707,000
Earnings	1,778,733	1,486,026
3 Mo Shr	.44	.43
Revenue	6,763,407	4,598,843
Tax Cred	52,200	232,985
Earnings	502,598	464,119

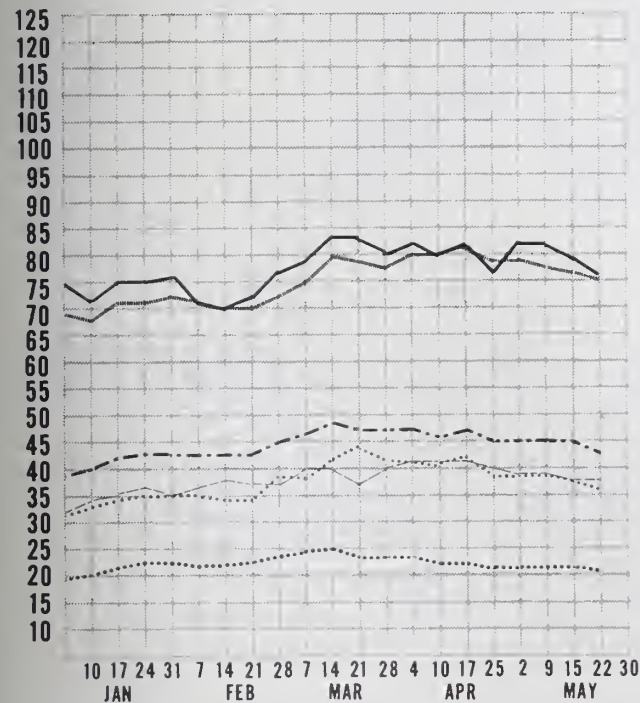
ITEL		
Three Months Ended March 31		
	1974	1973
Shr Ernd	\$.27	\$.10
aRevenue	29,389,000	14,889,000
Disc Op	.....	233,000
Tax Cred	150,000	338,000
Earnings	2,066,000	744,000
a-From continuing operations.		

DATA 100		
Three Months Ended March 31		
	1974	1973
Shr Ernd	\$.29	\$.17
Revenue	13,913,000	7,654,000
aTax Cred	360,000	232,000
Earnings	891,000	504,000
a-Tax loss carryforward.		

CUBIC		
Three Months Ended March 31		
	1974	1973
Shr Ernd	\$.24	\$.20
Revenue	18,400,000	13,600,000
Earnings	537,500	444,800

COMPUTERWORLD Computer Stocks Trading Indexes

- Computer Systems
- Software & EDP Services
- Peripherals & Subsystems
- Leasing Companies
- Supplies & Accessories
- CW Composite Index



*** WANTED ***

Firms to: Buy
Sell
Lease
Sub-Lease

360 & 370 Systems and I/O

Write or Call Collect - Today
Its our only business

NVC COMPUTER SALES, INC.
Suite 616, Benjamin Fox Pavilion
Jenkintown, Pa. 19046 • (215)-887-5404
Member Computer Dealers Assoc.

Disk Cartridges for Burroughs B-1700 and B-700

Only 85!!!

Yes, we have both regular and double density cartridges (type 9985-2 and type 9985-4) at this tremendous savings. Meet or exceed Burroughs specifications. Fully warranted. Price includes shipping. Take advantage of these tremendous savings now.

Order Information
Send your check with your order to
GROUP 3
6399 Wilshire Boulevard,
Los Angeles, Calif. 90048.
Specify cartridge desired.
California residents add 5% for sales tax.

Any questions? Call toll-free...
800-421-0702. In California, call
collect...213-653-1833.

Computerworld Stock Trading Summary

All statistics compiled, computed and formatted by
TRADE★QUOTES, INC.
Cambridge, Mass. 02139

PRICE						PRICE						PRICE					
1973-74		CLOSE	WEEK	WEEK		1973-74		CLOSE	WEEK	WEEK		1973-74		CLOSE	WEEK	WEEK	
RANGE		MAY 22	NET	PCT		RANGE		MAY 22	NET	PCT		RANGE		MAY 22	NET	PCT	
(1)		1974	CHNGE	CHNGE		(1)		1974	CHNGE	CHNGE		(1)		1974	CHNGE	CHNGE	
COMPUTER SYSTEMS																	
BURROUGHS CORP 49-126 98 5/8 -6 1/2 -6.1																	
COLLINS RADIO 16-26 24 3/4 0 0.0																	
COMPUTER AUTOMATION 5-20 11 1/4 -3/8 -3.2																	
CONTROL DATA CORP 28-62 27 3/4 -2 3/4 -9.0																	
DATA GENERAL CORP 28-49 32 3/4 -3/4 -2.2																	
DATAPoint CORP 10-21 12 1/4 -1 -7.5																	
DIGITAL COMP CONTROL 2-6 3 5/8 0 0.0																	
DIGITAL EQUIPMENT 73-121 114 5/8 -1 7/8 -1.6																	
ELECTRONIC ASSOC. 2-9 2 -1/4 -11.1																	
ELECTRONIC ENGINEER. 6-14 8 3/8 -1 1/8 -11.8																	
FOXBORO 23-48 34 1/4 -3/4 -2.1																	
GENERAL AUTOMATION 22-55 36 -3 1/4 -8.2																	
GRI COMPUTER CORP 1-3 1 3/8 0 0.0																	
HEWLETT-PACKARD CO 70-99 88 1/8 +3 1/4 +3.8																	
HONEYWELL INC 68-139 70 -4 -5.4																	
IBM 216-340 216 1/8 -6 1/4 -2.8																	
INTERDATA INC 7-22 19 1/4 -2 1/8 -9.9																	
MICRODATA CORP 2-10 3 -1/8 -4.0																	
NCR 27-46 32 3/4 -2 1/2 -7.0																	
RAYTHEON CO 22-39 34 1/8 -1/4 -0.7																	
SINGER CO 30-74 29 1/2 -1 3/8 -4.4																	
SPERRY RANDO 36-56 36 7/8 -1 -2.6																	
SYSTEMS ENG. LABS 1-8 1 1/2 -1/8 -7.6																	
TEXAS INSTRUMENTS 83-138 108 1/2 -2 1/4 -2.0																	
ULIMACC SYSTEMS INC 1-11 1 1/2 0 0.0																	
VARIAN ASSOCIATES 9-20 8 3/4 -1 -10.2																	
WANG LABS. 11-34 12 1/4 +5/8 +5.3																	
XEROX CORP 106-169 112 7/8 -1 7/8 -1.6																	
LEASING COMPANIES																	
BROTH COMPUTER 1-5 1 1/8 0 0.0																	
BRESNAHAN COMP. 1-2 2 1/8 0 0.0																	
COMOISCO INC 3-17 3 1/8 -1/4 -7.4																	
COMMERCE GROUP CORP 3-6 4 5/8 +1/8 +2.7																	
COMPUTER EXCHANGE 1-1 1/4 0 0.0																	
COMPUTER INVSTRS GRP 2-8 1 3/4 -3/8 -17.6																	
COMP. INSTALLATIONS 1-2 1 0 0.0																	
DATRONIC RENTAL 1-3 1 1/4 -1/8 -9.0																	
OCL INC 0-3 1/2 -11.1																	
ORF INC 3-9 3 3/4 0 0.0																	
EOR RESOURCES 1-3 3 1/4 0 0.0																	
GRANITE MGT 1-6 1 1/4 -1/4 -16.6																	
GREYHOUND COMPUTER 3-6 3 1/2 -1/8 -3.4																	
ITEL 4-12 4 3/8 -3/8 -7.8																	
LEASCO CORP 8-18 9 3/4 -3/8 -3.7																	
LFASPAC CORP 1-8 1 1/2 +1/4 +20.0																	
LECTRO MGT INC 1-2 3/8 -1/8 -25.0																	
NRG INC 3-15 3 1/4 -1/2 -13.3																	
PIONEER TEX CORR 3-10 3 1/8 0 0.0																	
ROCKWOOD COMPUTER 1-3 3/4 0 0.0																	
U.S. LEASING 13-36 13 -1 3/4 -11.8																	
SOFTWARE & EDP SERVICES																	
ADVANCED COMP TECH 1-2 1 -1/8 -11.1																	
ARRLIED DATA RES. 2-4 2 1/4 -1/4 -10.0																	
ARPLIFO LOGIC 1-3 1/4 -1/8 -33.3																	
AUTOMATIC DATA PROC 29-94 33 1/4 +4 1/4 +14.6																	
ARANON APPLIED SYST 1-1 1/4 0 0.0																	
CENTRAL DATA SYSTEMS 3-9 3 1/2 -1/2 -12.5																	
COMPUTER DIMENSIONS 1-5 2 0 0.0																	
COMPUTER HORIZONS 1-6 2 1/4 0 0.0																	
COMPUTER NETWORK 1-5 1 3/8 0 0.0																	
COMPUTER SCIENCES 2-6 2 1/2 -3/8 -13.0																	
COMPUTER TASK GROUP 1-2 1/2 0 0.0																	
COMPUTER TECHNOLOGY 1-3 1/2 0 0.0																	
COMPUTER USAGE 3-9 3 +1/8 +4.3																	
COMPRESS 1-2 3/8 0 0.0																	
COMSHARE 2-9 2 7/8 +1/8 +4.5																	
CONROUR CORP 2-15 3 1/4 +3/4 +30.0																	
DATATAB 1-4 1 1/4 0 0.0																	
FLECT COMP PROG 1-2 1/4 0 0.0																	
ELECTRONIC DATA SYS. 12-56 15 3/4 -1/4 -1.5																	
INFONATIONAL INC 1-2 1/2 0 0.0																	
INFORMATICS 2-7 6 3/4 0 0.0																	
I.O.A. DATA CORP 1-1 3/8 0 0.0																	
IPS COMPUTER MARKET. 1-5 3/4 0 0.0																	
KFANE ASSOCIATES 2-5 3 1/2 0 0.0																	
KEYDATA CORP 3-12 3 1/2 +1/8 +3.7																	
LOGICON 2-7 3 1/8 -1/8 -3.8																	
MANAGEMENT DATA 1-5 1 3/8 -1/8 -8.3																	
NATIONAL CSS INC 18-42 22 1/2 -3 -11.7																	
NATIONAL COMPUTER CO 1-1 3/8 0 0.0																	
NATIONAL INF SPVCS 1-2 1/8 0 0.0																	
ON LINE SYSTEMS INC 12-31 28 1/4 -3 -9.5																	
PLANNING RESEARCH 2-7 2 3/4 +1/4 +10.0																	
PROGRAMMING METHODS 17-25 17 0 0.0																	
PROGRAMMING & SYS 1-1 7/8 0 0.0																	
RAPIDATA INC 2-24 2 1/2 0 0.0																	
SCIENTIFIC COMPUTERS 1-3 3/4 -1/8 -14.2																	
SIMPLICITY COMPUTER 1-4 1 0 0.0																	
TCC INC 1-1 1/4 0 0.0																	
TYMSHARE INC 6-13 11 1/8 -1/8 -1.1																	
UNITED DATA CENTER 3-6 2 3/4 -1/2 -15.3																	
URS SYSTEMS 2-8 2 1/2 -1/4 -9.0																	
WYLY CORR 3-11 3 -3/8 -11.1																	
PERIPHERALS & SUBSYSTEMS																	
ADDRESSOGRAPH-MULT 6-34 6 1/2 -1/4 -3.7																	
ADVANCED MEMORY SYS 4-23 3 1/2 0 0.0																	
AMREX CORP 3-7 3 1/2 -1/4 -6.6																	
ANDERSON JACOBSON 2-6 2 1/2 -1/4 -9.0																	
REEHVE MEDICAL FLEC 3-10 3 1/2 -1/4 -6.6																	
ROLTA-RERANEX & NFW 6-12 6 5/8 -3/8 -5.3																	
BINKER-RAMO 6-18 6 1/8 -1/8 -2.0																	
CALCOMP 5-16 8 3/4 -1 -10.2																	
CAMBRIDGE MEMORIES 8-17 10 1/8 -1/2 -4.7																	
CENTRONICS DATA COMP 13-38 19 1/4 -2 1/2 -11.4																	
CODEX CORP 8-19 11 1/4 0 0.0																	
COGNITRONICS 1-3 1 3/8 +1/8 +10.0																	
BALTIMORE BUS FORMS 4-9 5 1/2 0 0.0																	
BARRY WRIGHT 5-13 5 1/6 -1/4 -4.6																	
CYBERMATICS INC 1-3 1 1/4 0 0.0																	
DATA DOCUMENTS 17-50 36 7/8 -6 1/8 -14.2																	
DUPLEX PRODUCTS INC 6-11 10 5/8 -3/8 -3.4																	
FNNIS BUS. FORMS 5-8 5 1/2 0 0.0																	
GRAPHAM MAGNETICS 7-20 8 1/2 +1/4 +3.0																	
GRAPHIC CONTROLS 7-12 9 3/4 -1/4 -2.5																	
3M COMPANY 60-91 69 1/2 -2 1/2 -3.4																	
MOORE CORP LTO 48-65 48 3/4 -1 1/2 -2.9																	
NASHUA CORP 32-58 33 1/4 +1/4 +0.7																	
REFYNOLOS & REYNOLDO 24-51 24 -1/2 -2.0																	
STANDARD REGISTER 11-20 14 1/2 -1/2 -3.3																	
TAB PRODUCTS CO 6-23 6 -1/2 -7.6																	
UACRO 15-23 19 5/8 0 0.0																	
WARASH MAGNETICS 5-8 5 1/8 -3/8 -6.8																	
WALLACE BUS FORMS 14-26 19 7/8 -1 1/8 -5.1																	

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

Now that you've decided on DOS/VS...

consider what you'll need to make it do the job for you.

GRASPVS: Designed specifically for Virtual residence in **DOS/VS**, this powerful enhancement package can mean the difference between an efficient, productive installation and a disaster. **GRASPVS** provides throughput increases of up to 50% over other modes of operation. Efficient, streamlined spooling is part of the reason. Complete accounting provides everything from Page Pool analysis for the Systems Programmer to complete cost accounting for management. An automatic, optimized Dispatching Monitor is available to ensure that **DOS/VS** works with top efficiency. These and countless other capabilities make **GRASPVS** the Systems Software for exceptional performance under **DOS/VS**.

EPATVS: Along with the greater potential of **DOS/VS** comes greater complexities. Tape handling and control become more complicated. Operator errors and tape librarian errors are bound to increase — unless they are *eliminated* with **EPATVS**. A complete Data Set Catalog system for tapes, including Automatic Volume Recognition, **EPATVS** is the way to get your tape library under control, keep it that way . . . and allow you to return a tape drive or two.

FMAINTVS: Though powerful, **DOS/VS** is hobbled in all its library functions by MAINT, written 10 years ago to do library functions on a 16K non-multiprogramming 360/30. SDI has produced **FMAINTVS**, a program which removes the operational restrictions of MAINT, provides many additional capabilities . . . and runs 5 to 10 times faster.

DOS/VS has many shortcomings and presents many problems. SDI knows the problems and is ready with the answers. Our worldwide family of GRASP users know that SDI Systems Software pays for itself by substantially increasing the operating efficiency of DOS installations. Powerful equipment needs powerful Systems Software — like **GRASPVS**, **EPATVS** and **FMAINTVS**. Let SDI show you how to make the move to **DOS/VS** profitable and easy. Talk it over with our local representative. He's a highly trained Systems Software specialist, thoroughly schooled in **DOS** and **DOS/VS** problems, and how to solve them. His valuable advice can save you a lot of headaches . . . and money. No obligation, of course.

Call SDI, (415) 697-3660, or use the handy coupon.

SDI

880 Mitten Road
Burlingame, California 94010.

Please send literature on:

_____ GRASPVS _____ EPATVS _____ FMAINTVS

_____ GRASP _____ EPAT _____ FMAINT

_____ Please have my SDI representative call.

We have a 360 _____ 370 _____ Model _____, _____ K

Name _____

Company _____

Address _____

City _____ State _____ Zip _____

SDI

880 Mitten Road
Burlingame, California 94010